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MEEHANS' MONTHLY.

A Magazine of Horticulture, Botany
and kindred subjects.

CONDUCTED BY

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ASSISTED BY

THOMAS B. MEEHAN, J. FRANKLIN MEEHAN, S. MENDELSON MEEHAN.

VOLUME IX,
1899.

ILLUSTRATED WITH COLORED LITHOGRAPHS,

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Preface to Volume IX.

TRUST WHY a completed volume should be expected to be given a preface, has never been demonstrated. Everyone knows that it is not begun till the work is finished. It is like as if we should say "Good-bye" when we meet a friend, or, "How is your health?" when we part. It is, however, more appropriate in a work on flowers, than elsewhere,—for the introduction to a flower's beauty is by the expansion of its petals, when the vigorous growth ends.

And so in this preface we commend our work to the good will and admiration of the reader,—hoping to have many more pleasures of a similar task in the years to come.

CHIMAPHILA MACULATA

CHIMAPHILA MACULATA.

SPOTTED WINTERGREEN.

NATURAL ORDER ERICACEÆ.

CHIMAPHILA MACULATA, Pursh.—A span or more in height, more simple (than *Chimaphila umbellata*) ; leaves oblong, or ovate-lanceolate, obtuse at base (an inch or two long), sparsely and very sharply serrate ; the upper surface variegated with white ; peduncle two-fifths flowered ; bracts linear-subulate ; filaments villous in the middle ; flower comparatively large, three-fourths inch in diameter. Gray's *Synoptical Flora of North America*. See also Gray's *Manual of the Northern United States*, Wood's *Class-Book of Botany*, and Britton and Brown's *Illustrated Flora of the Northern United States, Canada and the British Possessions*.

This remarkably pretty species is figured in Hooker's "Botanical Magazine," plate No. 897, but with more of a pink tinge than is usual here,—where it is generally of a pale, waxy white, assuming a slight pinkish tinge only when the flowers begin to fade. It is found not rarely in woods composed of coniferous trees, but seems most at home in deciduous forests,

"Where the leaves, that are plaited, and woven above,
Shut out every glimpse of the sun and the sky,
And the flowers are pale as a mourner in love,
And ever are wet like the lids of her eye."

—to quote from our American poet, Percival. It is in these obscure recesses that the "flowers are pale," and the most vigorous and healthful specimens are found. It was among the earliest of our native flowers to become known to the botanists of the Old World. It was then known as a *Pyrola*, and Gronovius, who from Clayton's specimens wrote the *Flora Virginica*, describes it as the *Pyrola*, with only one or two flowers at the apex of the stalk. Linnæus named it *Pyrola maculata*, evidently as suggested by the description of the old author, Plukenet: "*Pyrola mariana * * ad nervium linea alba utrinque per longitudinem discurrente.*" But this white line, running down the nerve, scarcely warrants the designation of "maculate," or spotted, which Linnæus gave it. There is, however, a strong disposition to retain the original form of the names of plants however meaningless they may be, though in modern times some consider this to be carried to excess. In relation to this very plant, Rafinesque, in a paper in 1809, (according to Prof. McMillan, for the author has not been able to verify this by an examination of the original), following Michaux's suggestion, that the American forms should be divided from *Pyrola*, proposed the name *Pseva* for them. But by a paragraph in his "Medical Flora," he states that *Psiseva* was the name he proposed. The difficulty in ascertaining just why Rafinesque proposed this distinction is enhanced by careless citations. Professor McMillan gives it as "Jour. Phys., vol. 79 (1809)." Rafinesque sometimes contributed to a French *Journal de Physique*, edited by Desvaux, but there is nothing of his in this volume or at that date. Rafinesque, himself, states in the "Medical Flora," that he proposed the name in 1808, but does not indicate through what medium it was published. In the "Flora," however, he admits he was wrong in proposing it as a substitute for *Pyrola*,—that at best it ought to be reduced to a sub-genus, and then to have reference to one species only, the one now known as *Chimaphila umbellata*. *Chimaphila* he would retain as the name of a sub-section, under which only our present C. *maculata* should be placed. Rafinesque was fond of abbreviations in writing. It is more than likely he originally wrote *P'ssiva*, and it was so printed,—he intending Pipsissewa—the Indian name.

Under the Indian name of Pipsissewa, (Pursh, by the way, writes it Sipsisewa), the plants have become well-known ; Pursh identifies it with the present species, though all other authors refer it to *Chimaphila umbellata*.

Up to comparatively recent times, botanists did not admit of any great power in a plant to vary. In many cases, a marked departure from the general form would be attributed to hybridization. An examination, of a long suite of specimens in an herbarium, of *Chi-*

COLOR PLATE

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COLOR PLATE
INTENTIONAL SECOND EXPOSURE

maphila maculata, affords an interesting study. In this direction variations are remarkable, yet no one would suggest a mixture of *Chimaphila umbellata* in any of them. In a collection before the author, is a specimen gathererd by Schweinitz, in Salem, North Carolina, in which the root-leaves, two inches in diameter, are nearly round. Another specimen, labelled by Pursh as having been "collected in North America, by J. Fraser," has the upper pair of leaves broadly ovate and with only four pairs of small teeth.

On another specimen, locality not given, are broad, ovate leaves, and long slender ones on the same plant. A specimen, marked by Nuttall as having been collected near Philadelphia, has leaves three inches long, and less than half an inch wide, edged with numerous long and sharp teeth. There are many other variations, but no one would venture to suspect hybridization,—or indeed any thing but normal *Chimaphila maculata*. It would seem, from such an examination, that nature—abhorring monotony, apparently, had provided for variation within very wide limits, and yet without disturbing the autonomy of the species.

While *Chimaphila umbellata* has become a citizen of a great part of the world, our pretty species is distinctively American, and confined, in a great measure, to the Atlantic States. It seems to have been first known to the Old World, in a living state, through the indefatigable John Bartram. In a letter to him, dated April 6, 1759, Peter Collinson remarks: "Pray send me a sod or two more of thy pretty *Pyrola*, with variegated leaves. It flowered finely last year, but I see no young shoots, which makes me think it will go off after flowering." Dame and Collins, in their Flora of Middlesex Co., Massachusetts, say that though it is freely scattered over the county, only a few plants are ever seen in one place. It flowers there in July.

Few plants cheer the traveling botanical collector like the species of *Chimaphila* in the dark forests where they grow. A chapter in the life of Pursh, the famous explorer, giving a pathetic account of his meeting these,—then called *Pyrola*,—may be introduced here. He had been attacked with influenza in what were then real wilds in Pennsylvania and New York. But he could not rest. In his diary of August 13, 1807, he notes: "Having been informed about a very high fall of water at Pratt's Mills, I went to see it, it is about three miles from the place I staid at over night, I crossed several high lands, interrupted by valleys and came to the little stream which forms those falls, when I came to it, I could not perceive where it could have so powerful a fall, as it was told me, as the ground seems to fall very gently downwards as far as the eye could reach, and bordered at the East and West or rather hemd in by a ridge, over which it could not run, and through which there was no opening to go through; but when I came to the mill I was very agreeably surprized, by seeing the water fall down a precipice nearly perpenticulare to the depth of 300 feet in a deep gloomy hollow all at once. I was anxious to get down to the bottom, which I with some difficulty dit and indeed a more romantick scene I never beheld." He there, as usual, names the plants he found including the *Pyrolas* in the list. Without "cloathes," friends, or money he was nearly helpless. He had to sell his "fowling piece" to pay his board bill. He says "my anxiety of getting away from here is intense;" but he goes on noting, from day to day, the plants he saw. On the 19th, 20th, and 21st, he gave way "I have not the heart of doing anything for spleen and sorrow." On the 22d, he received $20 from Dr. Barton, and determined to go into Vermont; but the influenza struck him again. But he pushed on to Utica, and wondered what he should do if "deprived of going on with my pursuits." Still sick, he journies towards Rutland, still noting the plants as he goes, reaches Balltown on the 3d of September, and gets to Glen Falls on the evening of the 4th. Sick and tired, he "steals a ride," as the school boys say, in a farm wagon, and reached Rutland disheartened. But he pushes on "feeling very unwell to-day" as he continually expressed himself. "Cold and without cloathes and money, and no letters" made him heart-sick. The "fever and bloody flux alarmed him" —"worn down with vexation of mind at receiving no support whatever," he determines to "rough it through to Philadelphia the best way I can." Just as he was about to leave, a letter and money came to hand, but says he "as I have made up my mind, I will return to Philadelphia as quick as possible, the letter notwithstanding."

EXPLANATION OF THE PLATE.—Full-sized plant from the Wissahickon. 2. Anther, showing the opening by a pore.

WILD FLOWERS AND NATURE.

THE GLADSOME SUNSHINE.

Blest power of sunshine! genial Day,
What balm, what life are in that ray!
To feel therein such real bliss,
That had the world no joy but this,
To sit in sunshine calm and sweet,—
It were a world too exquisite
For man to leave it for the gloom,
The deep, cold shadow of the tomb!

—THOMAS MOORE.

WHITE CYPRIPEDIUM.—Some one, who has the not over-common thoughtfulness to send a stamp for reply, forgets to sign his name to the following communication :—

"Recognizing your position as very high authority relating to our native plants, I wish to get information about the rareness of the pure white variety of *Cypripedium spectabile*. I have collected this species West and East in many localities. It differs somewhat as to rankness of growth, and the depth of the tinting of the flowers. Near St. Louis, the plants were not over eighteen inches in height and the coloring of the flowers quite pale pink and evenly diffused. Near Chicago, I found plants over three feet high with very large flowers richly blotched with deep rose. In this locality of New York, I find pale and also extremely deep coloring. I knew that a pure white variety was mentioned in some Manuals, but until two years ago, though I had collected so widely, I had never seen a truly white form. You may imagine, then, my delight to unexpectedly find a plant with flowers of as pure a white as that of *Lilium candidum*, and of about the same beautiful, waxy texture, also of unusually large size and great substance. One bright spot of yellow adds to the beauty of the blossom. Of course, I removed my prize to my garden. It bore transplanting well, even the flowers lasting a week or more, exciting general admiration. It flowered well again this summer.

Mentioning *Lilium candidum* above, reminds me of a great find of *Cypripedium candidum* in a suburb of Chicago. This is always pure white, I believe, and accounted rather rare; at any rate, in all my botanizing I have found it but this once. Crossing a wet place, I suddenly came upon *more than a hundred* of this little beauty, with flowers like pigeon eggs. What a delightful surprise! I gathered about a dozen plants only, but told a friend of the remarkable locality. Imagine my surprise and disgust when a few weeks later he exhibited 106 (one hundred and six) finely prepared specimens, for exchange with botanists! Another visit to the spot revealed the fact that he had collected every plant.

I have never seen it growing since.

Will you please let me know, from your own experience and that of others, whether the white form of *Cypripedium spectabile* is very rare? It certainly is a very beautiful flower, growing fully as tall and lank as the ordinary form.

I might mention, also, the collection of a plant of *Lobelia syphilitica*, with pure white flowers, as clear a white as that of candytuft. I grew this for years in the garden. This is the only specimen I have ever found.

I am told *Lobelia cardinalis* is also rarely found in a white form. I have my eyes open for this, but it eludes me."

It is not uncommon, with all plants with colored flowers, to have plants with white flowers occasionally. But it is probably not known that the *Cypripedium* is so often in that class.

The writer does not remember meeting with one. It must be very beautiful, and no wonder our nameless correspondent is enthused thereby.

MANCHINEEL POISONING.—It is commonly said that the plant, *Bignonia leucoxylon*, grows in the shade of the manchineel-tree, and that it is a sure antidote for its poison. The late Asa Gray believed this to be true.

In like manner, it is thought that the plant *Colocasia macrorrhiza* is an antidote to the poison of *Laportea moroides*, an Australian tree. C. W. GREENE.

AUTUMNAL FRUITS IN OKLAHOMA.—The wild plants that produce attractive fruit in autumn here (Oklahoma) seem worthy of mention.

The small shrub, *Symphoricarpos Symphoricarpos*, Indian-currant, has racemes of bright red berries. The plant occurs on the banks of streams in moist places. *Phytolacca decandra*, Poke-root, is loaded with its racemes of black fruit which make the stems bend down. It is found in rich soil. *Smilax hispida*, Green-brier, grows in tangles over bushes along streams. The dark green fruit remains nearly all winter. One of the most ornamental is *Celastrus scandens*, Bitter-sweet, which does not confine itself closely to the streams, but may be found in rich places which are not too dry. It fruits abundantly and is often collected for decorative purposes. Perhaps a handsomer one than the Bitter-sweet is *Cebatha Carolina*, Coral-berry. It is found in situations similar to the Green-brier, and the short, thick racemes of coral-red berries are indeed beautiful. Another one that should be included is the *Sapindus marginatus*, Soapberry. It is a small tree or large shrub found along the banks of streams. The fruit hangs in large panicles from the ends of the branches and is yellowish,—nearly transparent, except the large seed in the center. It remains all winter. Various species of *Vitis* fruit abundantly, and beside being ornamental on the vine, they are gathered and made into jelly. *Menispermum Canadense*, Moon-seed, occurs frequently, but its beauty is far out-done by other plants.

Species of *Viburnum* also bear attractive fruit. Toward the holiday season, the *Phoradendron flavescens*, American Mistletoe, can be seen as tufts of green in the otherwise defoliated elm trees. In the fruiting stage, it is becoming scarce in the central part of the Territory, but is still abundant in the southern part. It surpasses all other native plants in the beauty of its fruit. The berries are translucent white, and are massed among the yellowish-green leaves. Residents, here, send it to their relatives and friends in the north and east, who have never, perhaps, seen any.

Stillwater, Oklahoma. E. E. BOGUE.

In all large establishments, it is impossible to get along without dictionaries and works of reference for the use of subordinates. For the use of the proof-reader of MEEHANS' MONTHLY, Webster's Dictionary is used for general subjects, and *Index Kewensis* for plant names. The proof-reader was sorely exercised over our correspondent's choice of names. He declared there never was such a name as "*Symphoricarpos Symphoricarpos*," and proudly pointed to *Index Kewensis* for the proof.

As reference is made to Indian-currant, the repetition of the name *Symphoricarpos* twice is no doubt a mere slip of the pen, the name employed in all the dictionaries being *Symphoricarpos vulgaris*. By *Cebatha Carolina*, *Cocculus Carolinus* is no doubt intended. In spite of the protests of the proof-reader, the names have been allowed to stand as written by our correspondent.

GOLDEN-RODS.—An interesting feature of the monthly meetings of the Morris County (N. J.) Gardeners' and Florists' Club, held in Madison, was the competitive exhibition of wild flowers, ferns and grasses. Number to count 10, and correctness of name to count 5. At first, there were quite a few competitors, but it eventually simmered down to A. Herrington, of Madison, and E. Reagan, of Morris Plains. Honors were pretty evenly divided. About six hundred species and forms were staged during the season, Considering that those were picked up at odd times a few days previous to the meeting, it does not speak badly for flora of Morris County. A list of the Golden-rods collected might not be uninteresting, though it is not a complete list of what is here:

Solidago squarrosa,		Sept. 14, 1898.
"	*bicolor*,	" 9, 1898.
"	" *var concolor*,	" 16, 1898.
"	*cæsia*,	" 16, 1898
"	*speciosa*,	" 24, 1898.
"	*arguta*,	" 14, 1898.
"	*juncea*,	Aug. 14, 1898.
"	*serotina*,	" 8, 1898.
"	" *var. gigantea*,	" 28, 1898.
"	*nemoralis*,	" 28, 1898.
"	*Canadensis*,	" 28, 1898.
"	*lanceolata*,	Sept. 9, 1898.
"	*rugosa*,	" 9, 1898.
"	*patula*,	" 9, 1898.

There are at least two species growing here, *rugosa* and *Canadensis*, varying considerably. I came across a variety of *Canadensis*, some time ago, quite floccose, or wooly.

Morris Plains, New Jersey. E. R.

THE WOODS IN WINTER.—The woods in winter have a peculiar charm, and one who walks with nature from spring to frost and rests, loses a period of continuity, which mars the perfectness, and destroys the symmetry of the whole.

In winter the woods are not dead,—on the contrary they are very much alive. There, on every side, life is abundant, and often is obtrusive,—inanimate things appear animate. Vegetation dormant and active is everywhere. The Possom curls himself in the roomy cavern at the base of a hollow dead tree; rabbits bound through the scrubby underbrush courting no risk; in the trees over-head the squirrels are never absent; the birds flit quietly through the clearing seeking shelter in the hemlocks. The snow stretches up through the laurels to the top of the hills and reflects a dazzling light; from the highest plane to the stream, the springs are replenished, and gorged to over-flowing, they bubble down the slope, endowed with a life which would seem their own. This is winter in the woods, and sensibly present, there is ever to a lover of nature, that indefinable companionship of nature,—a presence as personal as nature is real, both alike being spiritual,—if spiritually discerned.

It is during the fall and winter that vegetation prepares for spring, and then it is that nearly all—if not quite all—our early flowering plants perfect their buds.

Not a few of our spring plants disappear after they flower, and where there are "wood flowers" and rare, one must be on the alert to discover. A dry wood in winter is a most fertile retreat for a botanist.

Many of our common plants are evergreen, and their number and beauty unite to brighten the woods.

One cannot well imagine a sight much prettier than a group of Christmas Ferns projecting through the snow; or a scarlet dotted runner of patridge-berry against a bank of white; or a mat of *Marchantia* and *Chrysosplenium* spread below an ice-coated dripping ledge. These attract the eye, perhaps,—but there is the Trailing Arbutus, wild honeysuckle, and rhododendrons, budbound, silent, waiting to burst into life, mystical and wonderful,—obedient to the supreme law,—appealing to the thought.

The accompanying illustration is a nook in the "upper Wissahickon," Philadelphia. If a fragment of a wood appeals to you, is not a whole wood more complete? and is not every wood a unit in itself?—and does not every treasure stored, strengthen and insure the Fount? EDWIN C. JELLETT.

A WISSAHICKON WINTER SCENE.

HIRUNDO RIPARIA, BANK MARTIN.—A new bird, to me, seemingly of the Black Martin family (the *Hirundo labica*), imigrating to its southern home, I met with on October 19, upwards of two hundred in a flock. They circled around me several times, alighting on the tops of weeds and bushes, on the telegraph wires, approaching so near to me as if devoid of all fear to man. I was walking on the St. Joseph Railroad at the time, and the land was comparatively level; a stream passed me on the east and a wet-weather gully on the west, with willows about fifteen feet high growing in the gully. After circling around awhile, as if to locate their position, they all with one accord alighted or disappeared in the willows. Yesterday, the 21st, I met with a smaller flock of the same sort of birds, about fifty, on the same road, but not at the same place. I got a nearer view of this flock, and found they had blue backs, white breasts, with black and brown heads. A smaller bird than the Black Martin, with broad and short wings. Maybe

they are the Bank Martin, *Hirundo riparia*. In connection with their disappearing in the willows, brings to mind what people used to say about the swallows. They said that they went down into the mud on the appearance of cold weather and remained there all winter,—deep down into the mud; when the sun's heat reached them, they came up out of the mud again. I would like to know how far north these birds go for nesting purposes. Our bank swallow is a different looking bird, with long and narrow wings. F. K. STEELE.

Festus, Jefferson County, Missouri, October 24, 1898.

October 29, the Chimney Swift, *Cypsilus pelasgius*, is still here at this writing. It seems to be able to stand a quite low degree of temperature, as we have had ice twice over in the past three weeks. F. K. S.

XANTHIUM CANADENSE.—I have been examining one of the spiney fruits of *Xanthium Canadense*, found along the city street. It is a little less than an inch long, light green, elliptical in out-line and densely covered with quite long spines hard and incurved at the tip, the hooks all directed toward the apex of the fruit except the topmost row, where directions vary. The seed and lower third of all the spines are beset with translucent hairs, and the whole, when crushed, yields a peculiar aroma. I carried the seed in my pocket a few days and while there it become entangled with a long, fine hair, which, try as I would, I could not remove from the ensnaring hooks without breaking it. At the tip of the seed are two beaks like the mandibles of a "pinching bug," somewhat divergent and also hooked, the hooks being turned toward each other.

The oval husk is tough and offers much resistance to being torn open; but, when it does yield, reveals a pale, shining lining and contains two spindle-shaped black seeds, flat—flatter on one side than the other,—which, on cross section, reveal two straight cotyledons.

About the middle of last May, I found these queer seeds sprouting and growing, — found them in all stages from a softened pod to plants several inches high. The tough husk is softened and blackened by the exposure to the snows and wet of winter; and, in late spring, a blunt, stout caulicle puts out. Only one of the two seeds seem ever to mature—reaches earth, sends down a few rootlets and then with this anchorage, withdraws the fleshy seed-leaves from the rotten husk and expands them to the sun.

The fact of hairs catching so inextricably in the hooked spines suggests the possibility of the dissemination of seed on the hair or wool of animals or on the clothing of men, in the same general manner as do the seeds of Avens, Tick Trefoil, Beggar Ticks, Hound's-tongue and certain knot-grasses; the secret is all the same,—a hook or a barbed point which catches in the wool or hair and is dragged from the ripe receptacle or calyx. NEWLIN WILLIAMS.

HOSACKIA PURSHIANA.—Apropos of your mention of Dakota Vetch, on page 176, of the current volume, I would say that the scientific name of *Lotus Americana* there mentioned is the one now adopted by those in favor of the "New Nomenclature" for the plant formerly known as *Hosackia Americana*. As I understand it, the change was made by Prof. E. L. Greene, after studying the Old World species of *Lotus*, from which he concluded that the genus *Hosackia* was not distinct from the other. New nomenclature or not, it is much to be regretted that the genus which commemorates Dr. Hosack can not stand, as it is fitting that one who did so much for botany should be remembered in this way. Dr. Hosack was the originator of one of the first botanical gardens in New York, its site being on the grounds so long occupied by Columbia College in New York City.

WILLARD N. CLUTE.

Referring to Britton & Brown's Illustrated Flora, it appears to be Bischoff and not Greene that is credited with the new name *Lotus Americanus*. It does not appear to have ever been called *Hosackia Americana*, but *Hosackia Purshiana*. The facts show the impolicy of a change of name,—not on a question of priority, but on the value of a character. There is certainly something in this plant different from all others, or it would not be a separate species. Nuttall, Bentham, and other expert botanists, closely familiar with what a true *Lotus* should be, regard this "something" as distinct from *Lotus*. Their decision has been accepted for many years, and the name *Hosackia* has become part of universal literature. Another expert now has a different view from his fellow experts, and

changes the name. What guarantee have we that some other expert will not again present his opinion that *Hosackia* should still prevail? At any rate, the point we made is still unassailed,—that, on account of the use of an unexplained name for an old one in general use, the costly government publication was in a great measure valueless.

ANCIENT CORN.—A correspondent sends the following from the Philadelphia *Record:*

"While studying geology from nature, I recently discovered a large deposit of corn, of the white flint gourd variety, embedded in conglomerate rocks composed of carbonate of lime and silica. The grains are beautiful crystals, but the cobs are not so transparent.

The corn was evidently grown by the antediluvians, and from all appearances was husked and gathered by them and is evidently over 4,000 years old.

The deposit is in the extreme northeast part of the borough of Norristown.

The above discovery goes far to prove the existence of man on the Western Hemisphere during the antediluvian period." T. K.

Norristown, Pa.

Statements of this character require close analysis. "What is the antediluvian period?" What is "white flint gourd seed corn?" With farmers, generally, flint and gourd seed are separate races. They could scarcely be both in one.

A quantity of botanical material collected by an expert naturalist, in one of the caves near Norristown, was placed in the hands of the writer for identification some little time ago. Among these were supposed grains of corn. It was evident that this supposed corn was not botanical, but were the teeth of some animal. They were turned over to Professor Cope just before his death, who decided not only that this was correct, but that the teeth belonged to the peccary, an animal now extinct in this part of the world. These resemblances are so frequent, as to render all similar finds liable to doubt.

FRUIT AND FLOWERS AT THE SAME TIME.—Mrs. Kellerman, Columbus, Ohio, sends a branch of a pear tree, the fruit as large as small figs, with a spur on the same branch in full flower. The flowering cluster terminated a growing branch. In forming flower buds out of possible branches, the previous autumn, this particular prospective branch had not been wholly arrested. It had to grow a little before the flower buds at its apex were allowed to blow.

SCHOOL-CHILDREN'S HERBARIUMS.—Of the premiums offered for Herbariums to the school-children of Hartford, Connecticut, noticed heretofore in MEEHANS' MONTHLY, Mrs. Seliger says :—

"We have had our Herbarium exhibition of what the school-children brought together. It was the centre of attraction at the Chrysanthemum show, and a more pleasing feature one can not well imagine. Notably perfect was the arrangement of displaying the flower sheets on double screens, hooked together and standing free with a passage between the rows. This showed to great advantage the specimen collected. About 6,000 of such had been sent in for the contest. All of them had some merit of more or less degree, and considering this is the first occasion that this has been set in motion, it was a grand success. Many visitors were surprised that we have so many native flowers, but you know the least and often most noxious weeds make the prettiest specimen for herbariums ; while bright and showy flowers mostly show to disadvantage on account of having lost their colors."

THE DOUGLAS SPRUCE.—An Oregon paper says that the Douglas Spruce of the Sierra becomes 400 feet high, with a trunk of 12 to 15 feet in diameter. It is used wherever strength and durability are desired, such as in the manufacture of ship timber, wharves, and piles, as well as for general building purposes, as beams, girders, joists, flooring, etc., usually called by lumber dealers Oregon Pine, the slender, tallest specimens being found in the Puget Sound region, but not the largest nor best.

THE AMMONOOSUC RIVER.—The conductors are annoyed to find that due credit was not given to the gentlemen who permitted the use of the illustration of the Ammonoosuc in the December issue of the MONTHLY. They are indebted to Messrs. Anderson and Price, Mount Pleasant House, New Hampshire, for this and other beautiful illustrations which may hereafter appear.

GENERAL GARDENING.

THE WIND IN THE EVERGREENS.

When the drifted snow has hidden
  Roads and fences from the sight,
And the moon floats through the heavens
  Like a frozen thing, at night,
Flooding all the frigid stretches with a ghostly, bluish light,
I like to lie and conjure
  Up old half forgotten scenes,
As the savage wind goes howling
  Through the sighing evergreens.

There's a cottage I remember,
  With an orchard in the rear;
There's a winding pathway leading
  To a spring that bubbles near—
Ah, the dipper that I drank from bears the rust of many a year!—
There's a peach tree near the window
  Of the room where oft I lay
In the long ago, and listened
  To the wild wind howl away.

—P. RISER.

SELECTING HOUSE-PLANTS.—Like "apples of gold in pictures of silver" is the good advice given in that recent article, and happy will they be who heed it.

Also by an amateur botanist, the same advice might well be heeded. A few plants, collected with care and given proper attention, with correct date, locality, etc., upon future examination will give much more satisfaction than many more specimens hurriedly put in press and neglected which will be looked upon later without pleasure and finally discarded as useless.

MRS. E. E. ORCUTT.

San Diego, Cal.

BEGONIA GLOIRE DE LORRAINE.—The beautiful, winter-flowering *Begonia Gloire de Lorraine* deserves every word of praise it has received, and any one who has a greenhouse where the temperature is kept at about 50 degrees in winter, should certainly have it. When not in bloom, the shining, dark green leaves are as beautiful as any "Rex." Good, turfy loam, plenty of leaf mould, well drained pots, the plants near the glass, and shaded from strong sunlight, no difficulty will be found in growing it to perfection.

JNO. THATCHER.

Wynnewood, Pa.

(8)

DEATH IN PLANTS BY FREEZING.—In the MONTHLY for October, p. 148, we were told that the sap of trees does not freeze even at as low a temperature as 12° below zero, and hinted by Mr. T. Wheeler, on page 149, that some "noted men," (I presume scientific, was meant), discredit the belief that moisture is absorbed from the atmosphere by the trunks of trees. This led me to ask the question, if these things be so, upon what part of the tree does the frost work, to cause them to split open in cold weather—not zero?

Can you enlighten us on that point?

A. MCL.

The living cells of a tree are those immediately below the bark; all the interior of a tree is dead cells. They are the skeletons in the closet. Moisture in these dead cells will freeze. It is the freezing in these dead cells that induces trunks to split in severe weather. The moisture in the active living cells beneath the bark can scarcely have the liquid in their cells freeze, or they also would split by expansion. The very fact that they can get through without splitting is evidence that they do not freeze.

A geranium dies under frost because in these, and similar instances, the liquid *does* freeze in the living cells.

PROTECTING ORCHARDS FROM LIGHT FROSTS.—It was, we believe, William Saunders, the enlightened chief of the Government Experiment Gardens at Washington, who, some fifty years ago, insisted, in leading magazines, that the text books were wrong in teaching that heated air ascended,—that is, ascended in an active sense. It was, rather, pushed up by the heavier cold air pressing against it. It seems a slight distinction but it has immense practical importance. For instance, those who understand this, smile at the Florida orange grower who builds fires around his orchard to make smoke when he fears a frost is coming. He lightens the atmosphere at the same time among the trees, and makes it all the easier for the heavy cold air to push in and take its place.

The modern thought to spray with water is more philosophical. Water is a good conductor of heat, and would add to the chances of resisting cold by the heat it would abstract from its surroundings. Horticulturists have long known that evergreens are quite hardy in a moist atmosphere, when they would easily succumb under the same temperature in a dry one.

THE USE OF HARDY PLANTS.—That the increased use of hardy plants has already created a noticeable improvement in the gardens of Lake Forest, as well as in the parks of Chicago, and that, as they become better known, they will be more appreciated and more extensively planted every year, is certain. The progress made in the cultivation of hardy shrubs and plants in our vicinity, is remarkable when it is remembered that most of them have been neglected and almost forgotten. This, at least, we must say about the hardy flowers, that our grand-mothers cared for, with the utmost delight. Give us plenty of those good old flowers, walls clothed with vines and climbers; and if we can have a rustic seat under a bower of foliage, let us have it.

Hardy plants, indeed, are far superior to tender ones, as, when a garden is once planted, it is permanent and does not, as in the case of the tender plants, require the expense of annual renewal; yet we should not abandon the annuals, as there are some very lovely ones amongst them, and that should find a place in our gardens.

Remarkable are the expenditures that go towards permanent arrangement and planting of hardy shrubs, vines, flowers and evergreen trees on the newly broken grounds in our vicinity

The most interesting summer-home is that of Mr. Byron L. Smith, who has named it "Sweet-Briar Hall." There are few hardy trees, shrubs, vines, evergreens or flowers listed in any of the many catalogues in this country that Mr. Smith has not tried in his extensive grounds of about forty acres. It is Mr. Smith's effort to make his home as beautiful and attractive as possible, both in summer and winter. "A garden should tell the seasons by its flowers," is an old saying; but how about winter, when all our beautiful flowers and plants have seemingly disappeared after a few October frosts, and when we awake in the morning and find our plants, like Sennacherib's army, all dead men? I am glad to say Mr. Smith's home grounds have at least an army of live men—hundreds of fine evergreens, Siberian Dogwood, native and blood-red dogwoods, Italian, Russian and Colorado Willows, Indian Currant and snow-berry, *Mahonia Aquifolium*, *Daphne Cneorum*, all kinds of *Berberis*, *Rosa rugosa*, wild roses, Sweet Briar Roses, *Viburnum Oxycoccos*, *Euonymus* red and white-fruited, we find making a beautiful winter prospectus. A few more have taken up the idea, in Lake Forest, and are carrying it out with enthusiasm.

One thing is wanting yet in the beautiful ravines and along the banks thereof, as well as on the shores of Lake Michigan, and that is "Natural or Wild Gardening," as one may call it. We find wide and bare belts of grass that wind in and around the shrubberies in nearly every country place, which are merely places to be roughly mown now and then; but if planted here and there with the snowdrop, the Japanese Anemone, the crocus, scillas and narcissus, they would, in spring, surpass in attractiveness the finest of gardens, and would pay its cost in one season, as, when once carefully planted, they need very little care. Even along the banks in the lawn, they would cause no trouble whatever; their leaves die down so early that they would scarcely interfere with the moving of the grass, if that were desired. On borders where one need not run the lawn mower, the prettiest results could be achieved. In grass not mown at all, we may have the narcissus and even the lilies, besides a great number of hardy wild flowers, which should be planted in natural groups or pretily-fringed colonies, spreading as they like after planting. Once established, the plants soon begin to group themselves in a way that leaves nothing to desire.

Many of our finest herbaceous plants, such as irises, Canadense and Superbum Lilies, thrive in the moist soil found in or near the bottom of the ravines or springs; numbers of hardy flowers, also, that do not naturally prefer moist soil, would exist in perfect health and grow freely among grass on the banks, and for this purpose, we might use day-lilies,

phloxes, irises,—especially the Germanica type,—many of the lilies, golden-rods, campanulas, tritomas, yuccas, hardy ferns, asters, and a host of other fine things. In Highland Park, on Mr. W. C. Egan's place, the most beautiful effects may be found half-hidden in the grass in just such locations as above described. Why should we not have it in Lake Forest?

E. BOLLINGER.

EXCLUDING MICE AND RATS FROM FRAMES.—In a note in October number, you say that a correspondent asks how to keep rats and mice out of frames. When the frame is set, scrape away the earth from the outside four to six inches deep and lay a board flat all around the frame, bringing the edge close to the frame. The board should be ten to twelve inches wide. Bring the earth back over it and tread it down. The varmints always try to dig close to the frame, and when they strke the board they quit. Not one has ever become sharp enough to back up and dig under the flat board.

This is an original device and has worked perfectly for twenty-five years in my garden.—No patent.

Louisville, Ky. M. M. GREEN.

GARDEN FENCES.—The old idea that a garden is a place in which to retire from the world and enjoy our pleasures was rather a selfish one. To enjoy a garden in the olden time was to retire between high walls or dense hedges, through which no prying eye could penetrate. The modern idea is to have everything exposed to public view, and this is probably as great an extravagance in one direction as the old prison wall system was in the other. In many of the suburbs of our cities, the idea of no hedges, fences or other boundary marks to gardens has prevailed to a great extent. The lawns and gardens have no boundary marks between them and the public streets. The driveway is made to appear as a portion of some great public park. Certainly this gives some advantage to the general traveller; but it does seem that one cannot abolish the idea of the "mine" and "thine" in human nature; and to give up one's garden to the public as if it belonged actually to them is a violation of a proper sentiment in human nature. A low hedge or ornamental fence of some kind, which does not absolutely exclude our garden treasures from the public; but yet marks a distinction to that which is ours, and that which is everybodies, seems more in accord with the proper order of things. The total abolition of these line fences or garden boundaries does not seem to be natural, and therefore not to be recommended.

PAINTING TREE WOUNDS.—Many a valuable tree is lost by the neglect to paint the scar left where a branch has been sawn off or broken by the wind. Insects and fungi will also destroy patches of bark on the trunks of trees, and the wood will rapidly decay, and the trunk become hollow. To prevent this rotting, exposed wood should be painted, dead bark taken off and the wood beneath also painted.

The object is to prevent decay till the new wood grows over it.

GRAFTING THE ENGLISH WALNUT.—A correspondent from Dover, Delaware, desires to know whether any one has attempted to graft the English Walnut on the Black Walnut or Butternut? If successful, many a grove of Black Walnuts could be turned into great profit.

It is said that in the vicinity of Homosassa, Florida, large plantations are being made of the English Walnut. These plantations have not yet come into bearing, and the healthy, vigorous growth is all that can be desired.

NEW CARNATION DISEASE.—Mr. Douglas exhibited specimens of Carnation plants badly attacked by a species of bacterium (*Bacterium dianthi*), giving a silvery appearance to the leaves. It had previously proved to be very destructive in America, and it is probable that it will now be so here. If the leaves are cut away when first attacked the disease may be arrested; spraying with a weak solution of ammoniacal copper carbonate may be tried, but the only remedy if it be more severe is to burn the plants. The fungus attacks the middle of the leaf, and then spreads both ways.—*London Gardeners' Chronicle.*

MOVING A HAWTHORN TREE.—Mr. W. C. Egan, Highland Park, Illinois, notes: "I moved a hawthorn from the woods five miles away, to-day, taking four horses, six men and about three pocket-books, to get it in place. The frozen ball was six feet in diameter and two feet deep. But few roots were cut, so that, with judicious thawing out, I feel certain it will succeed. It is the finest, thriftiest hawthorn I ever saw, having a trunk 4 inches in diameter, branched to within four feet of the ground, and low and broad. The young, vigorous shoots are so numerous that a bird couldn't fly between them, unless it could dodge branches as scientifically as a Chicago alderman dodges investigations. I presume it is twelve feet high and fifteen feet broad.

NEW OR RARE PLANTS.

COMPACT-FLOWERING WHITE FORGET-ME-NOT.—The tiny, charming Forget-me-not is so frequently forgotten when selections are made for the garden, that its name comes to us in almost a pleading way. But recently, MEEHANS' MONTHLY made mention of a white variety, recommending it in contrast with the blue. Now, it is with pleasure a compact-flowering variety is brought to notice by illustration. It goes by the botanical name of *Myosotis alpestris robusta grandiflora alba*—quite a good deal for such a little thing.

Most *Myosotis* prefer a slightly shaded situation, cool and more or less moisture; the species figured is adapted to rock-work; and all may be readily forced. We are indebted to *La Semaine Horticole* for the illustration.

PHYSALIS FRANCHETTI.—I have read with no little interest, the article on the above-named plant in MEEHANS' MONTHLY for November, by L. C. L. Jordan.

Had your correspondent seen the specimens exhibited at the Morris County Gardeners' Society's Meeting, in September, he might have modified that expression of "monumental fake."

The specimens referred to were three feet long, with 12 to 14 lanterns on, and each lantern from 2½ to 3½ inches in diameter; and from plants set out the past spring in good soil, and ordinary care the above result was attained. It is therefore evident, your correspondent's plants, after two seasons' trial, are under wrong conditions.

Learn to know your plant and you will know then what conditions it requires. The plant, I say, is worthy the boundless encomium with which it was introduced.

Madison, N. J. WM. DUCKHAM.

The notes of your correspondent, L. C. L. Jordan, concerning the above plant, have been read with interest, and would have been replied to in the spring, but I had hoped that the past summer the plant would have vindicated itself in your correspondent's estimation.

Of the many "fake" plants your correspondent has tried, he thinks this is the monumental one, but on the contrary, there is no doubt in my mind, that, grown as it can be grown, there is no hardy ornamental-berried plant that grows out-doors that is as good as it. We have

MYOSOTIS ALPESTRIS ROBUSTA GRANDIFLORA ALBA.

had the growths this summer three feet long, and from two to three dozen large "lanterns" on each shoot, of the brightest possible color, and when they are dried, they last for months on the shoot, in a very ornamental condition for indoor decoration.

Physalis Franchetti is a plant that needs rich soil and good treatment, otherwise, it is truly a poor thing that "drags on a miserable existence;" it is true that it spreads by underground stems,—so do many other good things, still it is easy to transplant, or to eradicate.

If your correspondent had examined his plants a little closer, "the undiscoverable flying insect" would have proved to be nothing more than the larvæ of the Gold-bug, *Copto-*

cycla aurichalcea, commonly known as "peddlers," as they carry on their backs their cast-off clothing in addition to other impedimenta; he would also have found that this trouble is easily overcome by the application of a dose of Hellebore, or even Paris green, as any insect that eats the leaf is most easy to be rid of.

We have, it is true, in the past, had many fake plants foisted upon us under new or fanciful names; but this is not one of them, or the firm that sent it out would not have put it in commerce. We are indebted for it to a son of the great firm of Veitch, who collected it himself in his travels in Japan.

For the description of the *Coptocycla*, I am indebted to Professor Smith's (Rutgers) invaluable "Economic Entomology," p. 222.

South Lancaster, Mass. E. O. ORPET.

Little more need be said about this plant. It seems to be one of those cases where treatment has much to do. It often happens that plants which show to advantage in one situation, will fail to give satisfaction in another; while there are other plants pleasing everywhere.

THE HARDY FLOWER GARDEN.

BEDS OF SUCCESSIONAL BLOOM.—Where a little careful thought is given in the selection of plants for beds, splendid combinations may be made. There are few plants that are not more brilliant if massed, and it is possible to have masses of bloom in the same bed several times during one season. The writer has chiefly in mind the utilization of hardy bulbs of a permanent character, and a good example of succession is offered with these and herbaceous pæonies. There are many kinds of bulbs from which to select and plant, amongst the pæonies—say daffodils, tulips, hyacinths, snowflakes, snowdrops, crocus, etc.—and these will spring up and bloom early, just as the beautiful red shoots of the pæonies are extending. Lilies, to furnish bloom in the fall, after the pæonies have done their part, may also be interspersed. It is perhaps a more common thing to see seed of annuals sown in beds of bulbs, and by reason of the large assortment that may be considered suitable, this plan offers many possibilities.

FLORAL CALENDARS.—Though we cannot make a floral calendar to mark the days of the month, we can get flowers to tell us of the seasons. There are surely spring flowers, summer flowers, and fall flowers. The fall or autumn season commences, the astronomers tell us, on the 21st of September. By the beginning of that month, *Desmodium penduliflorum*, or, as it is sometimes called, *Lespedeza bicolor*, comes as a charming herald of the advance of the ripening time. Few plants make so grand a display, and a plant will increase in gorgeousness from year to year. A plant in the Meehan nurseries, that has been left in the same spot a number of years, was this year five feet high, and nine feet in diameter. The bright purple flowers so completely covered the plant, that its beauty could be seen a long distance away. Though of a shrubby character, and classed and planted as a shrub, its dies to the ground annually. The enormous mass of foliage and flowers cited above was all the work of about four months.

FRUITS AND VEGETABLES.

WINTER-PRUNING SMALL FRUITS. — Such fruits as the raspberry, blackberry, currant and gooseberry, need winter-pruning most particularly after they are beginning to age. One is very liable to let them over-produce or overgrow while they are still young, which makes them weak and unproductive of good fruit before their time. Old shoots thus weakened should be pruned entirely out, as well as the weaker branches that are too abundant to allow free circulation of air and light among the leaves.

Of raspberries and blackberries, only strong, sound young canes should be left. Gooseberries and currants fruit only from branches at least one year old, so judgment must be exercised to have a few young branches left to take the place of ones that may depreciate by age. Don't encourage more growth than needed, as the other branches will have more strength to give better and more fruit. Plants handled carefully have long lives before them.

PLANTING FOR EARLY POTATOES.—In St. Louis, potatoes for early use are planted about the middle of February. The Early Ohio is a popular variety for this purpose.

THE BANANA. The beautiful picture of a spike of banana flowers is from a photo taken at Daytona, Florida, kindly sent to us by Messrs. Anderson & Price, of Mount Pleasant House, New Hampshire. It is customary to say of the banana, that only the female plant is cultivated, and therefore the banana never seeds. But as the picture shows, this is not exactly the case. The stamens are there, but the anthers are not polleniferous. Under Prof. Meehan's discovery, first announced at the Salem meeting of the American Association for the Advancement of Science, now many years ago, that where a branch is in condition to produce female flowers, a little shortening of the supply of nutrition would favor the development of male and the suppression of the famale organs, it would not be impossible for the extreme end of the spike to produce perfect pollen. If so, it might be used on the female flowers, and new varieties of bananas be raised.

In the form in which it is now known, it has been under cultivation before human history begins, having been propagated from suckers in all that long time. Indeed, some have thought its appearance was coeval with the origin of man, and from its supposed prominence in the garden of Eden, it was named *Musa paradisiaca*. For all this long-time culture without seed raising, it continues healthy, and this fact is sometimes used in support of the argument that varieties do not run out.

Under greenhouse culture, it seldom bears fruit, though the writer of this paragraph has not overpleasant recollections of a successful instance. He was a student in Kew. It was over fifty years ago. A fine bunch had been successfully produced in one of the hot-houses. The young Queen of England was fond of visiting the gardens. Sir Wm. Hooker, always fond of the proprieties, said, "I want to present that bunch of bananas to Her Majesty. Go as fast as you can to such a house and get it. Hurry, or she will be gone." Of course the messenger dropped everything and ran, returning with its fruit in time to catch the Queen and Sir William just as her carriage was about to drive through the gates. The young Queen was an apt listener for information. The writer of this held the huge bunch up with one hand, and kept his hat in the other, while Sir William gave its history much as has been narrated above. It came difficult to hold, the hat was put on, and the bunch held by both hands. When the Queen had departed, the writer was sent for by Sir William. "How dare you, sir, appear in your shirt sleeves before the Queen; and then to put your hat on in the presence of Her Majesty!"

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MARKET PEARS.—Mr. Zimmerman, of Buffalo, N. Y., has been known for many years as a successful grower of pears for market. His dependence is chiefly on the following varieties: Bartlett, Howell, Beurre Bosc, B. Clairgeau, Duchess d'Angouleme, Beurre d'Anjou—Bartlett and Bosc as standards and Howell, Duchess, Clairgeau and d'Anjou as dwarf.

A BANANA FLOWER.

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A BANANA FLOWER.

INTENTIONAL SECOND EXPOSURE

BIOGRAPHY AND LITERATURE.

THE LESSON OF LIFE.

And life is but a fairy tale:
Its fondest and its brightest hours
Are transient as the passing gale,
Or drops of dew that melt in flowers.

—PERCIVAL.

PYXIDANTHERA BARBULATA.—The beautiful wreath of *Pyxidanthera barbulata*, Flowering Moss, in last month's number, is a pretty reminder of Lord Tennyson's "Queen o' the May,"—Tho' he was not Lord Tennyson when he wrote it. I have read that it was so popular and he heard it so often, that at times he regretted having written it. This brings to mind the story, that Dante was very angry when he heard his songs sung out of tune. Popularity must have its antidote.

E. E. O.

DAVID LANDRETH & SONS.—There are few nursery or seed firms that can boast of over a hundred years of existence. Most die out after a few generations. David Landreth & Sons, of Philadelphia, commenced with David Landreth in 1784, and, dropping the nursery business and confining itself to seeds and implements, has not only passed its century of existence alive and well, but has prospered from good to better all right along. It has recently made a new move of its retail department to Tenth and Market Streets, and now occupies one of the finest seed establishments in America, in the most prosperous business centre of the city. The honorable record of this famous firm, will induce a welcome from all good friends of horticulture for the progress indicated.

PRANG'S ILLUSTRATED CALENDARS.—The mission of art is to illustrate that which is useful. To our mind there can be no true art unless founded on utility, but we seldom see this recognized. Printed calendars are now essential,—not merely in business offices, but every where, up to our private houses. They are usually adorned, now-a-days,—but the illustrations have little relation to a calendar, and are usually anything but specimens of true art. It was a good thought in Prang to take up these necessities for every-day life, as subjects for the artist's skill. Specimens before us are admirable in every respect. Even the little glazed pocket postage and revenue stamp book, finds a place in the collection. In the olden-time, one would not think of handing a friend a calendar as a present,—but there could be no more appreciative New Year or Easter gift than a Prang calendar. There are numberless styles to suit all tastes.

ROBERT B. PARSONS.—The firm of S. B. Parsons & Co. — Samuel B. Parsons, and Robert B. Parsons,—will have a high place in the history of American gardening. The Flushing Nurseries followed close in the wake of the Princes in introducing rare trees and shrubs. Their nurseries comprised some two hundred acres. With the view to bringing this into real estate operations, rare trees were planted to permanently remain, and in 1872, the land was divided, and two nurseries established on each part, each brother still retaining an interest in each. Aside from business interests, the brothers took an active interest in any matter of national or humanitarian interest. It is sad to reflect that a life so valuable to mankind as Robert B. Parsons, should have suddenly ended on November 1st, by a railroad accident at Newton Station, Long Island.

PURPLE FLESH'D APPLES.—Apples, with a more or less pink tinge to the flesh, are common enough, but are great wonders to the ill-informed. The *New York Sun* has a wonderful story, dated at Monroe, New York, March 3d, about an apple tree, with fruit which has "crimson tints almost to the core," from the blood of an Indian maiden,—a love-lorn one, of course,—who was slain by an irate parent under the original of the present tree on the Turner farm. We may now believe the story that the Judas tree had once white flowers, but that they afterwards became red in shame that Judas selected that tree on which to hang himself.

WILLIAM SAUNDERS.—The soldier, the sailor or the statesman, is the hero of the times; but in numerous walks of life are men who deserve as well of their country, but who usually pass away as nine-day wonders with regret. Few have done more to merit honor at the present, and remembrance in the very far future, than the gentleman whose portrait appears with this. Mr. William Saunders, the Chief of the United States Experiment Gardens at Washington, the Capitol of our Nation. As founder of the great order of The Patrons of Husbandry, — as the designer of the National Cemetery Grounds at Gettysburg, and as one of the three Parking commissioners that have made the streets of Washington the envy of the world, his name, if not his modest personality, is widely known. In his favorite department of gardening, his usefulness has been unique. For twenty years, in the earlier part of his career, his great ambition was to elevate gardening, and his intelligent and instructive writings, given freely for the public good, did yeoman service in this direction. Of all men, he had the happy faculty of turning scientific abstractions to practical uses. One of the most practically useful lessons ever received by the writer was derived from Mr. Saunders, as stated in another column, namely, that heat did not ascend in an active sense, as one might imagine from the text books, but in a passive sense, being forced upwards by the colder air getting under and lifting it. Millions of dollars to-day are yearly lost in abortive attempts at ventilation by reason of not noting this simple fact.

WILLIAM SAUNDERS.

William Saunders was born at St. Andrews, in Scotland, on December 7, 1822,—the seat of a great university. His father was a gardener for a wealthy gentleman who resided chiefly in India, so that the gardener had his home in the mansion, amidst pleasant and refined surroundings. He was sent to college with the design of entering the ministry, on which his mother had set her heart. William's taste for gardening was, however, strong. He left the divinity college, and became a gardener's apprentice bound for four years. Freed from his apprenticeship, he came to London to still further perfect himself in practical gardening, and engaged himself as a journeyman under the famous gardener, Kinghorn, at Richmond, about two miles from Kew, about the time that Thomas Meehan entered as a student in the Royal Gardens. While other students, in what may be termed university plans, spend much of their spare time in frivolities, William Saunders' occupations in these days were chiefly devoted to perfecting himself in architectural and map drawing in connection with Landscape Gardening. In 1848, he married in London, and his honeymoon was spent in a voyage across the Atlantic. The beautiful Clifton Park, now Johns Hopkin's University, was his first great work in America. Following his profession of Landscape Gardening, he accepted, from Isaac Newton, the first commissioner of agriculture, the position he now occupies.

It is to the credit of the Nation, so proverbial for political changes, irrespective of the right man in the right place, that through all the changes of administration in these long years, no thought of a change in this department seems ever to have been suggested.

MILTON'S MULBERRY TREE.—An English paper tells us that in the gardens of Christ's College, Cambridge, stands a venerable mulberry tree, which, tradition says, was planted by Milton during the time when he was a student at the University. This would be between the years 1624 and 1632, for the following copy, from the Latin, of his entry of admission, accurately fixes the former date, and his admission to the degree of M. A., to which he proceeded in the latter year, ended his intimate connection with the University :—"John Milton, native of London, son of John Milton, was initiated in the elements of letters under Mr. Gill, Master of St. Paul's School ; was admitted a lesser pensioner February 12, 1624, under Mr. Chappell, and paid entrance fee 10s." He was then sixteen years and two months old. The tree, so intimately associated with his name, is now much decayed, but, in order to preserve it as much as possible from the ravages of time, many of the branches have been covered with sheet lead, and are further supported by stout wooden props, while the trunk has been buried in a mound of earth. The luxuriance of the foliage and the crop of fruit which it annually bears are proof of its vitality, but to insure against accidents and perpetuate the tree, an offshoot has been planted close by. In the event of a bough breaking and falling it is divided with even justice among the Fellows of the College, and many pieces are thus preserved as mementoes of the poet. It was during his residence at Cambridge that he composed his ode, "On the Morning of Christ's Nativity." "Lycidas," too, is intimately connected with Milton's life at the University, since it was written in memory of Edward King, his College friend and contemporary, with whom he, doubtless, shared the same rooms. In those days students did not, as now, occupy separate apartments, as witness the original statutes of the college :—"In which chambers our wish is that the Fellows sleep two and two but the Scholars four and four * * * * " in consequence of which a much closer intimacy was formed among them than is now possible. Dr. Johnson relates that Milton was flogged at Cambridge, but the fact is doubtful, though there is reason to suppose that he had differences with the authorities in the earlier part of his college career since he was transferred from his original tutor. This tree is still pointed out to visitors, and was, until recent years, especially marked by a bough of mistletoe growing upon it.

MEMORIAL TREES.—Says Mr. W. R. Smith, "I am very much in favor of memorial tree planting in public parks. In the Botanic Garden, at Washington, D. C., we have fifty trees thus made more interesting. Senator Hoar's fine plant of *Cedrus Libani* is of interest to Massachusetts people. Its companion, planted by Senator Evarts, is doing nearly as well."

GENERAL NOTES.

LARKSPUR POISONOUS.—There seems no end to plants supposed to be sheep-kills. The Montana Experiment Station places the pretty western larkspur, *Delphinium glaucum*, on the proscribed list.

SPARTANBURG, SOUTH CAROLINA.—A correspondent says :—"I was particularly pleased with a visit to Spartanburg and Glen Springs, in the upper part of this State. The plants and flowers were delightful. It is a remarkably pretty town of about 12,000 inhabitants, and its beautiful residences and lovely flower gardens, remind me very much of Orange, New Jersey. I was told, in Spartanburg, that the common name of the pretty, yellow orchid, *Habenaria ciliata*, was "old-woman-in-a-cap" from the sort of frill around the flower."

POSTAL SAVINGS BANKS. — Mr. Horace J. Smith, son of the late John Jay Smith, formerly Editor of *Downing's Horticulturist*, is devoting his chief energies in the endeavor to get our country to copy from England her very successful Postal Savings Banks. That he may succeed is the wish of all who know that there is no better foundation for morality than the habit of saving. It induces industry. Lovers of gardening are proverbral for industry.

PASSIFLORA INCARNATA

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COMMON AMERICAN PASSION FLOWER.

NATURAL ORDER, PASSIFLORACEÆ.

PASSIFLORA INCARNATA, Linnæus.—Leaves palmately three-lobed, acute, serrate; petioles bi-glandular; peduncles three-bracted; sepals with a horn-like point below the apex, whitish within; filaments of the crown in about five rows, the two outer ones as long as the sepals; berry large, oval. (*Chapman's Flora of the Southern United States.* See also Gray's *Manual of the Botany of the Northern United States*, Wood's *Class-Book of Botany*, and Britton and Brown's *Illustrated Flora of the Northern United States, Canada and British Possessions.*)

Few plants show better the great progress which has been made in botanical knowledge than this, for when it was first introduced from the New World to the Old, it was classed with *Clematis* by the best botanists of those times. Now it is known to be widely different from that type of flower.

It is indeed very closely related to the cucumbers; but is regarded as sufficiently distinct to form a natural order by itself, under the name of *Passifloraceæ*. The botanical name of the genus, *Passiflora*, seems to have been first used by Plukenet, in 1705, and to have been adopted by Linnæus, though most botanists tell us "it was altered by Linnæus from the old name *Flos Passionus*, or Passion Flower."

Our species, *Passiflora incarnata*, and one from South America, *Passiflora cærulea*, seem to have been the earliest known, though now the species are found to be comparatively numerous. All are natives of the American continent, though only eight species are as yet known within the boundaries of the United States.

Our species is recorded as having been known in England in 1629; but Parkinson, who issued his famous "Paradisus" then makes no mention of it. An old letter, written about this time, and published in "Notes and Queries," tells us that "Mistress Tuggy hath it in good plenty growing in her garden at Westminster." Gerarde, however, who wrote some thirty years before Parkinson, makes brief allusion to it, and charges some Spanish Friars with great imagination in calling it *Flos Passionus*. Monardes, a physician of Seville, in Spain, about the time that Gerarde was writing in England, seems to have been the earliest writer extant who refers to the flower as "representing the Passion of Christ." Hernandez, an early writer on Mexican plants, says "it is the flower of the Passion of the Italians." But the earliest and most complete account of the flower, as it appeared to our forefathers, is given by a French writer, Louis Liger d'Auxere, translated into English in 1705, we give as follows: "'Tis not without Reason this Plant is called the *Passion Flower*, for this Plant cannot be thought other than a miracle, seeing it bears a *Flower* on which God has been pleased to imprint the chief Mysteries of the Passion and Death of our Blessed Saviour. All that behold it cannot but be astonished to consider how it was possible that Torments should be represented to us on a *Flower*. What shall we say of those Leaves, that round their Edges show us as it were sharp Prickles? Do they not truly represent to us the Thorns with which our Divine Master was crown'd? The whiteness that appears on the Leaves, is it not a Mark of his wrong'd Innocence? And these little bloody Threads, that we see thereon, do they not figure to us the Scourges Jesus Christ received from the Hands of the Jews? And what Reflection can we make on this little Mark, in the shape of a Column, that rises in the middle of the Flower, but that it is a Picture of that to which our mild Redeemer was bound? How well does the little part below it represent the Sponge dipt in Gall? How well do the Threads that stand out beyond the Column, figure to us the three Nails that nailed him to the Wood of the Cross? And, lastly, do not the Leaves that are pointed at the end, give us a perfect *Idea* of the Lance that pierced his Sacred Side. Would not all this be a perfect Image of all the Instruments of his Passion, if this Saviour of Mankind would have permitted his Cross, that is indeed wanting, to be expressed on it?" In Catholic countries, how-

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COLOR PLATE
INTENTIONAL SECOND EXPOSURE

ever, the Passion Flower is used in the memorial services of the 14th of September, which is the day set apart for the festival of the Holy Cross. By modern floral emblematists, the Passion Flower has been selected to represent the most contradictory emotions. It is most commonly used as an emblem of "Hope"—probably from some lines of Cartwright, who, alluding to the fact that the flowers last but one day says:—

"Thus hope, the passion-flower of human life,
Whose wild luxuriance mocks the pruner's knife,
Profuse in promise makes a like display
Of evanescent blooms—that last a day."

It is remarkable that a flower which so affected the religious spirit of its first observers, has failed to make its mark in modern poetry. Lines in reference to it are numerous, but little has appeared of a high order. Whittier makes good use of the Passion Flower in his picture of the wild swamps in which Toussaint L'Ouverture—the once slave and finally general commander-in-chief of the successful armies of San Domingo—had his earliest dreams of liberty.

"The white cecropia's silver rind
Relieved by deeper green behind,—
The orange with its fruit of gold,—
The little paullinia's verdant fold,—
The passion-flower with symbol holy,
Twining its tendrils long and lowly.—"

Our species, *Passiflora incarnata*, does not climb over trees, as its West Indian relatives do, for it is herbaceous, dying to the ground every year; but it will sometimes ramble over low bushes, occasionally to the height of 20 feet or more. Its roots are creeping, and will travel long distances under ground. The leaves are always deeply divided with three parts, which obtained for it the name of *Clematis triloba* from the earlier botanists. At the base of the leaf-blade are two glands (see fig. 4.) These are always present in plants of the order *Passifloraceæ*, and are one of the ready marks by which it may be distinguished from neighboring orders. The flowers open early in the morning, and last only one day; but the plant is very floriferous, and is never without bloom when it once commences. In our flowers, Figs. 2 and 3, it will be noticed that in the former the three pistils are erect, while in 3 they are bent down over the stamens. This different condition seems to be characteristic of each separate flower. The subject of these differences has not been understood. Humble bees, which are very fond of visiting the flowers for their sweets, become densely covered by pollen, and one might imagine that the stigmas in No. 3 would be more likely to receive pollen from other flowers in this way than in Fig. 2, which have the stigmas more out of reach; but in the writer's garden, it is extremely rare that any plants produce seed,—though other cultivators report that it fruits abundantly with them. It is remarkable what a fascination the honey secretion has for humble bees. One will remain for hours on the same flower, sometimes resting as if intoxicated, but flying away easily and returning to the same flower when disturbed.

It is a native of the Seaboard States south of the Potomac River, where it is commonly known as "May-pops," and sometimes "May-apple," though in the North this name is used for the *Podophyllum peltatum*. The fruit is pleasantly acid, but is not ranked as highly among edibles as those of some other species, of which it is said "the Indians open the fruit as they do eggs, and the liquor is supped off with great delight." It has not attained any great reputation in medicine, though Dr. Phares, a botanist and physician of Mississippi, believes it to have remarkable powers in cases of lockjaw.

With possibly some half-dozen exceptions, the passion-flowers are natives of the New World, and are most abundant in the tropical regions. Brazil presents them in great numbers. There have been between two and three hundred species described already, and explorations are continually adding to the list. Only some half dozen extend into our territory, and none are found wild north of the Potomac. The one illustrated is the most beautiful of all,—indeed, the other species are comparatively insignificant. So far as mere beauty is concerned, interesting as our common American Passion Flower is, it is far inferior to many of the tropical ones. Some of these are superlatively grand. Many have found their way into cultivation and are popular for conservatory decoration.

EXPLANATION OF PLATE.—1. Specimen from Virginian seed. 2. Front view of flower. 3 Side view of flower. 4. Glands on the leaves. 5. Bud with bracts at the base.

WILD FLOWERS AND NATURE.

SUNRISE.

'Tis early morning, ere the Sun
His golden course has yet begun;
The pale gray dawn ascends the skies
As struggling darkness slowly dies,
And seems the hovering soul of Night,
Which, e'er to Heaven it takes its flight,
Still lingering hangs, 'tween fear and hope,
To watch the golden portals ope.

—MARY BAYARD CLARKE

THE POISON IVY.—In regard to the article on Poison Ivy, I beg to enclose you three drawings from nature, full size (now reduced one-third.) No. 1 is of the low-growing or grass variety—it runs under the ground, rising every now and again, as shown. The stems of the leaflets, which are always in threes, grow to 5 and even 7 inches high, light green and shiny. In hot weather they droop like clover leaves. The berries in all three varieties are alike in form.

The other variety (marked 2) will climb over stone fences and often clings to trees; the rough bark seems to afford it a hold. In this variety, the stems are often as thick as a lead pencil and smooth. They will rise 3 to 5 feet above the ground. It is reputed as being more dangerous than No. 1.

No. 3 is a tall shrub often, here; 6 to 10 feet high, close in habit, the leaves 9 to 11 in., wrinkled and decided, turned up or sideways at the apex. The leaves are darker than No. 1 and 2, and of all three, they turn orange and red in the fall. The berries are all alike, a very light green, or pale straw color. There is no rule as to size, as large berries are often found on 2,—as large as peas; but they are generally smaller. The flowers (see 2) are pale green, nearly white, in all the varieties.

The best remedy I know of is the Rhus Tox. of the homeopathists. A strong lather of common soap is also useful. Apply with a shaving brush until the itching stops.

I think the infection comes from spores as well as by contact. Many cannot go near it without being affected. Others, myself among them, seem to enjoy a perfect immunity from it. I can pull it up by handfuls—and do. It is very plentiful on the shores and islands of the River des Milles Iles.

Thoreau says "It blazes its sins as scarlet." This is so in the fall, but its sins are as apparent in their effects at any time—especially after rain.

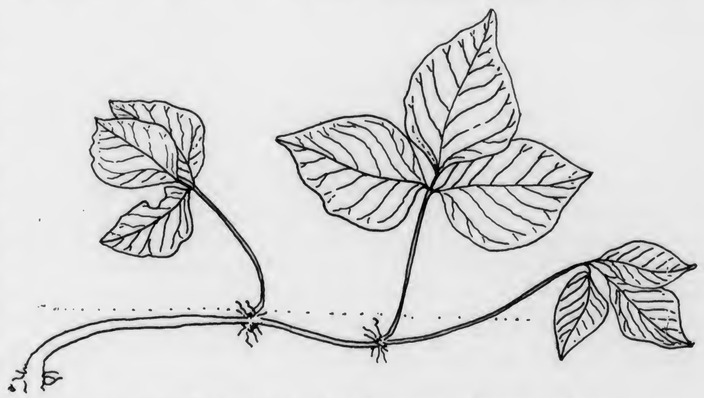
JOHN HUGH ROSS.

Montreal, Canada.

NOTE.—In No 2 the terminal leaflets are always larger than the others; in No. 1 they are generally smaller.

By "variety" our correspondent evidently means condition, as it is well known that the creeping form climbs when it gets the opportunity, and changes its character with the new condition. This is the case with similar climbing plants.

The English ivy, wild strawberry tree, and even many honeysuckles have very different



No. 1.—**RHUS TOXICODENDRON,** Low or Grass Variety. (⅔ size.)

foliage when shoots trail along the ground than when climbing poles. And "spores" indicate particles of organic matter given off by the plant.

BUD VARIATIONS.—Of late years, much has been learned of the manner in which nature works; but the amount of secrets which nature has carefully locked up is in vast proportion greater than the little scraps of knowledge we have been able to secure. Bud variation is one of those mysteries yet unsolved. It is not an uncommon thing to find a plant or tree, which

No. 2.—**RHUS TOXICODENDRON,**
High-Growing or Tall Variety. (⅔ size.) See page 19

for years has borne flowers or fruit according to rule, as one might say, all of a sudden send out branches of a character often widely different from that of those which have preceded them. It is more remarkable, as a fact, that when these different branches are cut from the parent tree and rooted as cuttings or preserved by grafting, this wandering from the original form continues hereditary, and can be reproduced innumerably, just as the parent plant can. Many new roses have been raised in this way. Some of them have been of the most distinct character. In fact, those who watch for these variations or, as they are technically called, sports, can secure as many new varieties as those do who look for new variations from seedlings. Fruit trees are especially subject to these variations. Sometimes a pear tree will have a branch with fruit which look as if they might be apples, and again apple trees have been known to produce pear-like fruit. Not only is this difference in form but also in color. Plum trees, that for years will bear nothing but the normal purple-fruited plums, will send out branches occasionally with yellow-colored plums, and others may differ also in form,—that is to say, we may have round, yellow plums instead of egg-shape, purple ones. One of the most striking instances of this is in the case of the nectarine. A well informed biologist simply says he does not know what causes these wild wanderings from normal forms,—he merely tells the student there is a chance for you here in original investigation which may bring you fame if you can work out the cause.

FREEZING OF THE SAP IN LIVING PLANTS.—"It takes time for the secrets of nature to be developed and understood. Life is a great gift, both in the vegetable and animal world, and in it resides much power of resistance to both cold and heat. Investigation often proves it were not well to scorn the investigations of others."

O.

The last idea expressed by "O" is worthy of more thought than it usually receives. When we note the millions of people on the earth who have beliefs and moral sentiments wholly different from ours,—and the myriad millions who in the past have entertained them, we naturally feel like the one man who held out on the jury of twelve,—he never met with such obstinate men as the eleven in all his days. There seems, in fact, nothing that any of us believe, but may in some way receive a rebuttal. We are taught that matter and its properties are infinitely divisable and believe it from one point of view; but when we start a rocking chair, we firmly believe that it does cease from its rocking to absolute rest. No amount of figuring would lead even the one man on the jury to believe that it really kept rocking for ever. Particularly is this true in scientific discussion. We can only reach approximate truth —and the other fellow may have a good share of it.

IMMEDIATE EFFECT OF POLLEN ON FRUIT.—A gentleman called on me, a day or two since, and said: "I would go to growing fine muskmelons, if I could get to some isolated place where the bees and insects would not mix up the melons." I said to him that, if he could get new, good seed every spring, it would make no difference, for good melons would grow from the good seed the first year and not be affected by fertilization—that year,—meaning that the melon that year would be good, but that melons grown from seed from *that* melon *might not be good*. He thought the melon grown the first year would be affected by the bad pollen. I told him *no*. Was I correct? (You were. Conductors.)

Well, after retiring to bed that night, I was thinking over the matter of melons and good seed, and I remembered that, when a boy, I occasionally found red kernels of corn mixed with the white corn—evidently affected by that year's fertilization, and so I began to feel as though I was mixed myself. Then, I remembered again, that our old, sweet apple tree always bore fine, yellow, mellow, sweet apples, and although there were *red apple trees* in the same orchard and near the sweet apple tree. If I am mixed, I would like to be unmixed, if you can do it. What do you think?

Minneapolis, Minn. R. J. MENDENHALL.

You are right in all these observations. The *seed* is affected directly by fertilization,—the *fruit* is not. The covering of a melon—botanically the consolidated carpels—is the modified leaves of the original plant. The seed, inside the fruits, is the after-product of fertilization, and is the essential part of the new plant, which is the result of pollenization, and is of course affected by that act. A grain of corn is the actual seed. It has no coverings as the melon, apple, cherry and other fleshy fruits have,—or as those have with dry seed-vessels. The corn grain can be affected,—the others named cannot.

This fact was ascertained many years ago, by some careful experimenter in raising improved German stocks. Florists know that in pink varieties of flowers the stems will have a purple tint, while the light ones have pale stems. Examining the seeds of the stocks, he noted that this fact embraced the cotyledons or seed leaves of the plants as well. He could therefore tell at once which of the seeds would produce crosses or hybrids by this test alone. But though there was this change in the seeds after fertilization, there was no change in any single character from the parent plant in the seed-vessel itself.

INVERSE GROWTH.—A correspondent sends a newspaper slip, stating that some one had made a tree grow by planting the branches and leaving the roots in the atmosphere where the branches should be, and says: "I have never seen

No. 3.—**RHUS VENENATA.** (⅔ size.) See page 19.

any article on the question. My idea is that, while nature could, *in time*, change the functions of root and branch, as a rule the tree would die during the interval. I've noticed that exposed roots in time become possessed of a bark similar, in looks, at least, to that of the branches proper. If this subject has not been treated recently by you, it would be of interest to your readers to have you treat it."

Cuttings of willow, poplar, gooseberries, currants, and many other things which get planted upside down by accident, occasionally grow,

just as well as if put right side up. There is, therefore, no physiological reason why a tree might not grow when planted as described, if there were not too great a head of roots to evaporate moisture rapidly. There is little doubt that a willow, planted upside down, would grow very easily, if the roots were cut back as severely as we sometimes do branches at transplanting.

SMILAX WALTERI AND S. LAURIFOLIA.—In the Pine Barrens of New Jersey, many southern plants are found which reach their most northern limit in that State. Among these, two species of *Smilax* may be noted: *S. laurifolia and S. Walteri*,—both climbing vines, whose favorite habitat, in New Jersey, is the wet ground at the edge of Pine Barren swamps. There they are objects of beauty and interest, in winter-time quite as much as at other seasons. *S. Walteri*, indeed, has an especial attractiveness in the late fall and winter; for then, although stripped of leaves, the brilliant clusters of ripened berries, a bright coral-red in color, are showier than ever leaves and blossoms were. Glowing against the dusky background of the swamp, the fruit makes a picture of rare loveliness, worth a long trip to see.

S. laurifolia is an evergreen whose winter glory is its leaves—laurel-like in shape, and in texture thick and leathery. In their axils, the berries grow, immature and green in winter, ripening the following summer. It is a stout vine, whose stem is armed with savage thorns. Sometimes found climbing high upon the trees of the swamp, it is quite as fond of lying stretched horizontally along the tops of bushes, its rich, green leaves standing upright on their stalks, and making the plant a conspicuous sight in the season when the shrubs over which it clambers are bare of foliage.

Philadelphia. C. F. SAUNDERS.

RURAL SCENERY IN CONNECTICUT.—While renewing his subscription to the magazine, under date of December 18, a Hartford correspondent says: "Though nearly eighty-four years' old, I still retain a great deal of horticultural fervor, and enjoy it exceedingly. I am in the blessing of a very fair amount of health, am out in the open nearly every day, and often go to my farm on Cedar Mountain, four miles south of the city. There is nothing like it around Hartford; the two vallies, the one on the west, and the other, the Connecticut River valley, are most charming. Yesterday was cold, clear, with a piercing wind; the sleighing was excellent, and the contrast between the clear white snow and the deep green of the hemlocks, was enchanting. By the way, what more graceful, and beautiful evergreen have we than the hemlock, so neglected, perhaps, because it is so common, valuable as a tree standing alone, or useful as a hedge?"

THE AGE OF TREES.—Mr. Timothy Wheeler, whose acute observations and intelligent writings have interested the readers of MEEHANS' MONTHLY, has a paper in the *Stowe* (Vermont) *Journal* in regard to ascertaining the age of trees. In the course of his remarks, he comments on the fact that the annual rings are often wider on one side of the trunk than the other,—and that at times there may be two fine rings in one year, instead of the usual wide one. He explains the former occurrence to the fact that there has been more food at the command of the roots, and more vigorous leaves and branches to elaborate the food from which wood has to be formed on the side of the tree where the thick wood rings are than on the other. That this explanation is undoubtedly sound may be proved from cutting across the old stems of creepers on walls—the ordinary poison vine furnishing a good illustration. The roots can, of course, be only on one side of the stem, and all the wood is on that side. It is very interesting to see a piece of wood with the pith near the circumference instead of in the centre of the stem.

In regard to the age of trees, an approximate knowledge may be gained by fair knowledge of the comparative ratio of the thickness of the annual growth. The writer of this, for instance, had noticed that the annual growth of the wood of the Mammoth Sequoias in California was little more than the sixteenth of an inch, thus adding but one-eighth of an inch to the diameter of the tree. Finding thus that an inch was made in eight years, it would take six hundred and seventy-two years to construct a trunk of seven feet in diameter.

A three feet thick trunk of a Catalpa tree, which we know would make nearly half an inch in some years, might reach that diameter in less than fifty years.

THE STAFF-TREE OR BITTER-SWEET.—*Celastrus scandens* belongs to the order *Celastraceæ*, and has also the name of Roxbury Wax-work in some places. It is a twining shrub, leaves ovate, oblong, finely-serrate pointed. Along streams and thickets; June, according to Gray's Botany, and may have had the name of Staff-tree from stems, making pretty walking-canes. We have too long neglected this beautiful, clean vine, that we sometimes see in our drives over country roads and lanes, covering broken-down stone walls and unsightly fences with its charitable mantle of green, and later with bright berries. It has been known to waste its "bitter-sweetness" by the wayside, only appreciated by some nature-lover who passes it with lingering regret that cultivators do not appreciate it.

This vine has a fashion of twining in and out over itself, and whatever object its delicate twigs can reach, and in the most fantastic manner. The glossy green of its wax-like leaves, its dainty racemes of blossoms, blending so harmoniously with the gray of the mature wood, gives the whole shrub such an air of thrifty independence that is wholesome to look at. It would add oftentimes to the beauty of our home surroundings, comparing favorably with more pretentious vines and climbers.

But its crowning glory is in the autumn time, when the whole vine is ablaze with glory. The yellow fruit pods, round and smooth, that change to deep orange, hang in clusters. When fully ripe, they open, disclosing the bright scarlet seed covering. These remain on the vine all winter,—eaten to some extent by the birds, who use them as a tonic,—may be, who knows?

We never think the year full and complete without our annual gathering of the Bittersweet "to make glad the winter of our discontent." When our country landscape looks gloomy and forlorn, our berries are a perennial joy and gladness. Florists are beginning to learn their value and have used them this season in quantities for their holiday decorations, with fine effect.

SARAH BALLANTINE BOWERMAN.

ABNORMAL GRASS.—You will find enclosed a few heads of Timothy (*Phleum pratense*) showing a substitution of vegetative for sexual reproduction. I have a flower-pot covered on the soil with well rooted plants raised or grown from one of these heads.

Britton & Brown say "scales sometimes leafy." I send samples of both conditions.

I have not had time to give these heads a close inspection. They furnish a good botanical study.

Manchester, Illinois. JOHN C. ANDRUS.

The flowers of grasses occasionally produce young plants instead of seeds. This is called a viviparous condition. This, as Mr. Andrus puts it, is a substitution of vegetative for sexual reproduction. A careful examination of the specimens sent shows that this is neither a case of that kind, nor of a scale becoming foliaceous, as noted by Britton and Brown. It is the palea, this time, and not the scale or "chaff," that have become leaves. The stamens are perfect, but the gynœcium seems abortive. The little leaves, with even their sheaths perfect, projecting from the usual limits of a head of Timothy grass, is very striking.

ABNORMAL ORCHID.—Mrs. L. Goodrich sends a 3-flowered specimen of an *Odontoglossum*, in which the terminal flower has a double lip, and a double column. There are eight petals instead of six, as in a normal orchid flower. It is interesting to note, in connection with this, that what appears to be a terminal flower in this triad is an axillary flower which has thrust aside the normal axis, and assumed the position of the main stem for its own pedicel. It has so completely absorbed the normal main stem, as to leave but a small pin-like point. This unusual power of absorption explains the proliferous tendency exhibited.

ABNORMAL APPLE AND PEAR BLOSSOMS.—Refering to the paragraph on page 190 of the last volume, Mr. Wm. F. Schmeiske, Dorranceton, Pa., observes that the dormant bud being already formed there, was only awaiting the necessary nourishment to start. It happened to be short at the proper season, and continued dormant until the full supply arrived.

LADRONE PLANTS.—G. says: "The Ladrones being at some distance from the Micronesian Islands proper, ought to have some peculiar plant-forms. I am not aware that their native products have been specially examined."

GENERAL GARDENING.

A PEACH TREE WITH "THE YELLOWS."

Take them editors that's crowin'
  Like a cockerel three months' old—
Don't ketch any on 'em goin',
  Though they be so blasted bold;
Ain't they a prime lot o' fellers?
  'Fore they think on't guess they'll sprout,
(Like a peach that's got the yellers)
  With the meanness bustin out.

—BIGLOW PAPERS.

PRUNING PORCH VINES.—The object in pruning vines is to keep them neat and vigorous, and not permit a dense mat of growth, excluding light and air from the porch. To accomplish this, it is customary to cut back, in winter, the last season's growth to within a bud or two of the previous year's wood, leaving the stems close to the trellis—referring chiefly, of course, to those vines, like the honeysuckle, that make a thick, branching growth. The tops are usually trimmed off near the porch roof, and the operation is ended. The effect is to produce a strong, dense growth from the tops, giving a top-heavy, unkempt appearance by mid-summer, but fault in the pruning is rarely recognized then.

The best method of pruning summer-flowering vines, like the honeysuckle and clematis is to cut them down as near the ground as possible, in the winter, allowing the young vigorous shoots to cover the trellis each year, which they will quickly do. In the spring, when the new growth attains about two feet in height, go carefully over them, select four or five of the strongest or as many as may be needed to cover the required space, train them properly on the wires and any unneeded shoots rub off. By the time the shade is needed in summer, the vines will be high enough, and will not have the unsightly bunched appearance of other neglected ones. The clematis is not as strong growing, and if on the same trellis with other vines, should not be cut so low.

The same practice applies, to a certain extent, to the aristolochia, trumpet creeper, flowering grape, bitter-sweet and kudzu vine, though their growth is different—more rampant and less twiggy. The strong, rampant growth makes it all the more desirable that they should be trimmed low. It is very essential in all winter-pruning to attend to the young growth the following summer; and also in the foregoing method to prevent more branches starting than are wanted. The trumpet creeper and aristolochia should especially be trained to admit light and air to get good results. In the case of the latter plant, it is supposed to not flower until the growth is large. If flowering is wanted, the vines must be let go, though a topping during the latter part of their growing period might bring the flowers the following season.

The pruning of running roses is a subject of which experience is the best teacher. But the things to be kept prominent is that heavy, healthy canes are desired, and that pruning is best done in late winter, in addition to a little shortening in after blooming, a thing which is well accomplished by cutting the flowers.

There is a class of early flowering vines the pruning of which must be differently done if flowers are wanted. The akebia is one of these—and by-the-way, this is one of the choicest vines for a porch. Flowers are produced from old wood, and if the vines be pruned in winter, the flowers must go to the extent of the pruning. The chief time for pruning is just after flowering. Similar plants are the Carolina Jasmine, Yellow Jasmine and Wistaria. As an illustration, the sweet Carolina Jasmine rarely flowers as far north as Philadelphia because winter-pruned by the frost.

DISEASE IN LILY BULBS.—The Harris Lily has of later years suffered seriously from a fungus disease. That the spores, or probably the mycelium, of the fungus is distributed with the bulbs, has been with good reason assumed. A correspondent of the London *Gardeners' Chronicle* took diseased bulbs, dried them thoroughly, and then stored them in flower of sulphur. It proved to be a complete cure.

HOUSE PALMS.—When it comes to selecting plants for the house, many persons will differ on the subject of what is choicest; but nearly all unite on the palm,—and certainly it is most effective at all times and in all places.

To many a palm is a palm and nothing more; variety makes no difference. Of course, one cannot be displeased with any of the commonly cultivated kinds, but undoubtedly some are more desirable than others. To say the least, *Livistona rotundifolia* is one of the most pleasing of all. In general character of leaf, it resembles the well-known *Latania Borbonica*, which has broad leaves, the segments almost entirely connected, like a fan; but as the specific name—*rotundifolia*—implies, the leaf is very round, in a way resembling a ribbed water-lily leaf. The specimens are more compact, and make charming table center-pieces. It is a native of Java.

Mr. Dreer thinks *Kentia Belmoreana* does best of any in a house, as it stands more neglect; while the graceful, narrow-leaved *Cocos Weddelliana* is perhaps most popular.

It is becoming quite the thing to plant three in one pot of kinds like the *Cocos*, *Kentia* and *Areca*, which are rather erect-growing and do not fill out low with foliage. To those not posted, it would seem like one plant pushing up from the root. To illustrate this method, through the kindness of Mr. Henry A. Dreer, of Philadelphia, a photograph of a pot of Kentias is reproduced.

It would please intended buyers were they to go through the greenhouses of florists before purchasing, and see the many beautiful things that are suitable for house culture.

The popular name of the class of palms to which the *Kentia* belongs, is Feather Palm, and they are interesting as traveling nearer the South Pole than any other palm. They were not distinguished from *Areca* until about 50 years ago, when the Dutch botanist, Blume, named it after a popular authoress of that day, Miss Kent. Still, even this lady's honors are likely to be taken from her by the new namers of plants, who insist that our plant should be *Howea Belmoreana*. But, as often stated in these pages, it is impossible to change names after they have become widely in use, and this pretty plant will probably be always *Kentia* in gardening.

BUSHY MADE-UP PLANT OF KENTIA BELMOREANA.

CENTROPOGON LUCIANUS.—Though so seldom seen in cultivation, few plants, if any, are more deserving of general cultivation than *Centropogon Lucianus*. Its long, bright, rosy carmine, tubular flowers appearing, as they do, all through the dead of winter, make it a very desirable acquisition to any collection of plants, however small. The plant is a hybrid between *C. fastuosus* and *Siphocampylus betulæfolius*, and was raised from seed by M. Desponds, of Marseilles, in 1856. The genus to which it belongs is a very small but handsome one of herbaceous greenhouse perennials. It belongs to the order of *Lobeliaceæ*. They are all natives of Mexico and South America. The plant referred to is not (at least with me) at all difficult of cultivation. It thrives well in a temperature of about 60 or 65 degrees during the day and about 5 degrees lower at night, although 5 degrees lower will not hurt it..

The soil used is a light one, consisting of equal parts of loam, manure, sand and leaf mould. The drainage must be thoroughly efficient. It is easy of propagation either by cutting or division. The plant in this collection was im-

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INTENTIONAL SECOND EXPOSURE

ported, and although (as usual) it had a hard time before it arrived here, it soon recuperated and is a great source of satisfaction. It has been in bloom this season since November 25, and shows promise of being so all winter.

Rahway, N. J. ALFRED PEARCE.

A PLEA FOR NATURE IN LANDSCAPE ART.—There is one department of the general subject of landscape gardening, that is well worth much more thought than is usually bestowed upon it, either by landscape artists in their work, or, by those who write,—it is, *the preservation* of the beautiful in natural landscapes.

We have many illustrious examples in landscape work, of something made out of almost nothing; and all praise is due the noble spirit, the genus and the skill that can work out such wonders of beauty, where before there was barreness or monotony of scene, if not positive ugliness. We have a surfeit of so-called landscape gardeners, who can make geometrical designs in beds and shrubbery, and straight and crooked paths galore; but, have we enough of the higher sense of rural beauty, that can stay the hand of the destroyer of what God has made in forest and prairie, in stream and lake, and in mountain and hill? Have we enough applied skill, in the way of appropriating those things in nature which may be easily destroyed, but never, *no, never made* by the hand of man?

To my mind, there is no artificial landscape work in all the public parks and private grounds that I have seen that can favorably compare in pleasing aspect with the countless works of the Master Hand. Where is the shaven lawn that has so restful and peaceful an aspect as a mossy carpet in some woodland dell; or, the artificial waterfall that has the wooing witchery of a wild brook as it tumbles over its rocky bed? The former has a manufactured look, that is far from pleasing, in comparison with the free and easy style of Nature's handiwork. Yet, how many delightful rocks and rills, grassy knolls and shady glens are utterly destroyed to make way for something less charming to the lover of true beauty?

It is not always possible to save all the delightful parts of a natural landscape, in making a new home on a suburban lot, or, in the country proper; but, if the *heart* of the landscape gardener is right and he has sufficient skill, he can do much to preserve the beautiful. It certainly becomes him, and is worthy of his deepest study, *to appropriate without destroying* the gems of beauty which it has taken many years, if not ages, to create. Let those who may be entrusted with the planning of country places give more heed to the inspirations of nature and less to those of art. Indeed, it is the truest and highest art that uses and does not abuse the beauties of nature.

June 14, 1898 H. E. VAN DEMAN.

GROWING CHIMAPHILA. — The Chimaphila sends its roots down deep in the ground, and it increases by subterranean suckers. These are often taken for the real plants, and this doubtless accounts for the difficulty some find in getting transplanted stocks to grow. They should be treated almost as cuttings for a little while. Robinson, in his "Hardy Flowers in English Gardens," notes the difficulty cultivators there find in getting it to grow. The tendency to extend by these runners is the reason, probably, that it is never seen abundantly in any one place.

PLEASANT RAILROAD TRAVEL.—Why do not our railroad companies pay more artistic regard to their right of way along their tracks and about their stations? Is it because horticulturists do not jog them enough? True, some commendable steps have been taken by not a few companies, but as a rule the wayside grounds of railroads are a desert waste.

The travelling public is largely made up of the better and aesthetic classes, and while it does not fail to appreciate the commodious stations, cars and general business accommodations of the various roads, still nothing so pleasantly relieves the weary eye as a bit of landscape work, geometrical flower beds, nice trees, walks, and lawns, which could be introduced instead of chaos that prevails along many of our railroads. These grounds all have regular attention, anyway, and our experience is that it is about as cheap to keep a lawn and shrubbery as it is to be continuously battling with briers, bushes, and weeds. The millions of unused acres of the railroads of this country, afford extravagant possibilities for landscape and ornamental garden work, and it will be realized when the public, through its journals and otherwise, shows its appreciation

of what has already been done, and urges its continuance. GEO. B. MOULDER.

The suggestions of our correspondent are worthy of serious consideration by railroad officials. When attention has been called to the desirability of some improvement in this direction, the answer has been given that the road does not now pay any dividend to the stockholders, and it is not fair to tax them still more. But as our correspondent well suggests, it often costs less to keep things neat than to have them go slovenly, and every good business man knows that good appearances attract trade. It would seem that no one goes by rail merely to see a side show,—and yet figures prove that the same line, made attractive, carries more passengers than the same line would with poor cars and poor surroundings.

LEAVES AS FOOD AGENTS.—"HOW LITTLE WE DO KNOW."—I quote the title from a conversation on biology a friend of ours had with Dr. Dixon. The Doctor is president of the Academy of Natural Sciences, and one of the leading biologists. His remark was no doubt intended to give an idea of how much there was to learn, as compared with what has already been discovered.

Several years ago, I planted a Balsam Fir tree where the waste water from the pump would run, but on ground dryer than that from which we had taken it. It was very small and therefore liable to be tramped down by the horses or cows, and as I was anxious to have it run up fast, I cut away the lateral branches in order to throw, as I thought, the whole life energy into the terminal shoot or top. It persisted, however, in sending out lateral branches nearly twice as far as it sent the terminal branch up. I was puzzled, and wondered if, as the leaves of the tree had to perform the functions of the lungs, stomach, etc., of the animal, we were not starving our tree. It got up in the world only fourteen inches in five years and the lateral branches five years ago extended twenty-five inches. This last May, the terminal shoot made seven inches, more than double that of former years, and twice as much as the lateral branches. Now, had we given it some special food, or cultivated it in some peculiar manner, what delight we might have taken in telling our neighbors what to do when they wished to run a tree up fast. But we did nothing of the kind, all the conditions were the same as in former years, except that there was an excess of rain in May, the month in which that family of plants makes its growth for the season. My conclusions are that we should feed plants most when they are in the greatest need of nutrition. I manured my strawberry plants this season when they were just coming into bloom and had the best crop I ever grew. RODOLFUS BINGHAM.

EARLY SPRING IN THE GREENHOUSE.—With the advent of spring, everything in the stove and greenhouse will want attending to, especially adiantums and other ferns. Cut off all dead fronds close to the soil, and any plants that require a larger pot, see that they get it.

Propagation will also be in full blast. Crotons, Dracænas, and, in fact, nearly everything can now be increased more successfully that at any other time, as the bottom heat and temperature in the house are more regular and not liable to such great changes as may occur later.

Roxboro, Phila. F. I.

TURF-MADE LAWNS.—A lawn that had been several years since put down under ordinary mixed lawn grass seed, was brought to the writer's attention as the snow was departing in early spring. The different species of grass had had time to spread into patches several feet in width. These patches were of as many shades of color as a crazy-quilt might be. The time will come when Mr. Olcott's method of planting a lawn, by one kind of grass only, will be the only method of making a lawn capable of competing for a beauty prize.

DRACÆNA TERMINALIS.—One of the most attractive plants on the Christmas market this season was a dark purple-leaved decorative plant, *Cordyline terminalis*—perhaps better known as *Dracœna terminalis*. Its peculiar charm is the new and growing central shoot, the leaves of which are brilliantly colored—"crushed strawberry," the ladies would call it. It is a good house plant of easy culture.

MANURING ASPARAGUS SPRENGERI. — The comparatively new *Asparagus Sprengeri* furnishes excellent sprays for bouquets. To encourage good growth, it should have a heavy application of manure and a regular supply of water while growing.

NEW OR RARE PLANTS.

ACALYPHA SANDERI.—One of the most recent novelties in decorative flowering plants is *Acalypha Sanderi*. It is properly described as being always in flower, and these very flowers are the source of interest. They are in long, slender, rope-like racemes, of a light red color. It makes an interesting ornamental plant that every one should have in their conservatory. The flowers are of the nature of colored bracts as in *Poinsetta*, which establishes the long character of its flowering season.

OUVIRANDRA FENESTRALIS, — LACE-LEAF PLANT.—What an interesting aquatic this is! Any one having a warm greenhouse should certainly have one. All it requires is a good, rich, turfy loam and plenty of cow-dung. It should be grown in a pot, plunged in a tub of water, where the hot sun does not strike it. The lattice-like leaves float just under the surface of the water, and, when well grown, measure about three inches wide and about twelve inches long. It is a native of Madagascar, and is rarely met with in private gardens around Philadelphia.

Wynnewood. JNO. THATCHER.

ANTIGONON LEPTOPUS.—Please permit me to say something about *Antigonon leptopus*, of which the December number has a description. I have raised *Antigonon leptopus* from seed and had some bloom the first year without any special care. I plant the seed in small flower pots and keep the plants in same until the weather permits to plant them out. But please give me permission to describe to you a large plant which grows here on a private place against the side of the house. This plant is about six years' old. It never gets any care, and withstood the winter of '95 to '96 (when orange and many other trees and plants were killed) without any other protection than its own leaves. In April, when the ground gets warm, the plant begins new life. It climbs up a wire trellis the best it can; its tendrils will cling and hold fast to anything in reach (like the tendrils of a grape vine). It grows up to six feet or a little more and then hangs over—and I wish you could have seen the mass of beautiful rich rose-red sprays of flowers. The sprays are about twelve inches long, and literally cover the plant on the upper two-thirds of the trellis. It begins to bloom the latter part of September, and will keep in bloom about two months. The plant is worth going to some trouble to get to bloom further north and east. I have not met with it in my travels in the east. I would advise putting the seeds in small pots in not too rich soil; keep the pots in a warm place and shaded, until the plants appear above ground (I raised my plants in a cucumber frame). I would plant the seedlings, after they are strong enough, in a larger pot or box, and sink it to the rim in the ground. Take them into the house in the fall; or plant directly in a place in the greenhouse, where the plant gets plenty air and light (at least in summer). Keep them away from stove heat. A small trellis will suffice for the first year or two,—in fact, the overhanging vines will produce flowers sooner. I should be glad to see you have success with this beautiful climber in the east, north and west. I have no seed or plants for sale, but seeds are offered in many of the seedmen's catalogues.

Ocean Springs, Miss. C. FORKERT.

THE HARDY FLOWER GARDEN.

THE POLYANTHA ROSE.—With this I mail a small package of Polyantha rose hips, which look at present so wonderfully pretty on my bushes that I must praise them a little, although they may not be unknown to you. A few years ago, I received three such tiny, dried up seeds in a letter from Germany, which were planted out of doors, and in due time produced miniature rose seedlings, two in number; they reached the height of four inches, and during their first winter, I covered them with a little flower pot. The second summer they grew to the height of about four feet without branching much, but showing plainly signs of being climbers, and also very thorny. They kept long their small green and shining foliage in the autumn, and without any protection came out the next spring ahead of everything, and also blossomed the earliest of all,—very small single roses, the size of a ten-cent piece, but clustered in masses so as to cover the whole post, against which I had transplanted them, with a snowy mantle, at a time when hardly any other shrubs were in bloom. Shoots grow from twelve to sixteen feet high on them now in one season. I have to cut them back a great deal. The hips stay on all winter and serve as a food for the newly arrived blue birds during snow-storms in the early spring. These hazy, but frosty mornings, on each seed capsule hangs a crystal drop of dissolved ice, or frozen vapor, which makes it look like a jewel-strewn tree of fairyland. What more can we wish from a rose so diminutive?

I saw recently, in your charming MONTHLY, a correspondent had not succeeded in getting blossoms in three months time from the seed, and so was disappointed. My experience with seedlings in all lines is not to lose patience. They generally turn out somewhat different than expected. WILHELMINA SELIGER.

PLANNING HERBACEOUS GARDENS.—While most herbaceous plants can be safely transplanted at any season, the best immediate results are obtained from early spring planting. It is therefore quite appropriate to lay plans at once, that orders may be sent in good time, and the stock received for early planting.

There are constantly improvements in garden flowers, as instance the double rudbeckia, Allegheny Hollyhock, Napoleon III pink, Japanese Iris, etc., and these properly claim every one's attention; yet there are also many old-fashion, well-known flowers that must not be forgotten. What garden is complete without the fox-glove, anemone, columbine, aster, chrysanthemum, larkspur, bleeding-heart, day-lily, flag, lavender, lily, forget-me-not, pæony, poppy, phlox, pyrethrum, golden-rod, spider-wort, veronica, periwinkle, and scores of others?

FRUITS AND VEGETABLES.

THE PINE-APPLE.—It is a trite saying, that we know the least about things that are always before us. This is true of the pine-apple. Who can tell us its story? We may guess that it is called pine-apple because the fruit looks like a huge pine cone; but who knows that it is really made up of a number of little fruits that have become succulent and consolidated into one huge mass? These single flowers are formed around the stem, and the crown is but the upper portion of the branch. Very little is known, yet, about the formation of these flowers in producing the fruit. It is believed that the fruit will not form at all unless they are first fertilized. As no attempt is made to artificially pollinate them, they must

A FLORIDA PINE-APPLE.

be close fertilizers and not dependent on insects for aid. But as the fruits never perfect seed when grown artificially in hot houses, the argument would be that this is owing to the absence of insects to aid in the work. The original plant dies after fruiting, and is replaced by suckers or sprouts, as seen in the pretty picture here used in illustration.

It is a native of the warmer parts of the New World. It is said that the first specimen of fruit that traveled safely to the Old World came from Barbadoes, and was a valued present to the English King, Charles the Second. Its general cultivation in "Pine stoves" in England only dates back to about 150 years. Mr. Edward Meehan, father of the senior conductor of this magazine, was among the noted in bringing pine-apple culture to a successful issue at the end of the past century.

Steamships and rapid transit have interfered with the great profits of the English pine-growers under glass, and rendered such pine growing an unknown art in America, but it seems that the English growers can still beat nature in regard to good quality,—and on this score pine-apple culture is still profitable in England.

The illustration is produced through the kindness of Messrs. Anderson and Price, Orlando, Fla.

POTATO SCAB.—A New Jersey correspondent sends samples of potatoes so pitted with holes, and roughened on the skin, as to be unmarketable. He thinks the special fertilizer he used caused the trouble. They were simply suffering from the operations of a minute fungus, resulting in what is known as the potato scab. These little parasites reproduce themselves just as the higher plants do. They can increase by division of the little plant itself, or by spores which, with them, act as seeds in the higher organisms. These propagative agencies were probably on the seed potatoes. Progressive people, in these days, never risk any large crop without steeping the seeds to destroy the enemy. Simple copperas water has been found efficient. For those who prefer to try other methods, the following from *Popular Science News* may be acceptable.

"Formalin, a non-poisonous, non-corrosive substance, will practically free seed potatoes from scab germs, by an immersion for two hours in a solution of the approximate strength of 1:300. It is equal to corrosive sublimate in efficiency, and is without its dangerous and troublesome properties. Seed material of seemingly good quality, as well as that much affected with scab, shows beneficial results from treatment. The recipe for its use is to add 8 fluid ounces (about one-half pint) of formalin to 15 gallons of water, and soak the seed tubers in it for two hours before planting. This solution may be used several times."

A NEW VEGETABLE.—Some three years ago, Mr. W. H. S. Wood, of New York, handed us to be tried in his gardens here, a package of vegetable seeds which he had received from a friend in North China. Among them were several varieties of bean, but the most valuable turned out to be a bush variety with pods from eighteen to twenty-four inches in length.

The pods are slender and the beans, which are of a brown or black color, wide apart in the pod.

The first year's product was saved for another year's crop; but the last two seasons we have been growing it for table use and consider it a delicious string bean. It requires a long season to grow and comes in late when a good string bean is highly esteemed.

Professor Bailey describes a similar pole bean in Bulletin 67 of the Cornell University Agricultural Experiment Station, under the name of *Dolichos sesquipedalis*, the Chinese name being *Tonkok*.

Mr. Charles Allen informed me that such a bean was grown by his father forty years ago. I have no doubt but it has occasionally been grown in this country, for the last century; but, however that may be, it deserves to be better known and will be greatly relished by any lover of such a vegetable.

Greenwich, Conn. JOHN W. DUNCAN.

KEEPING SNAILS FROM HOT-BEDS.—Chimney-soot is an obstruction to snails, and if placed thickly around hot-beds, will prevent their securing entrance.

CUMBERLAND BLACKBERRY.—It is claimed for the new Blackberry, Cumberland, that it is the largest blackberry as yet introduced.

BIOGRAPHY AND LITERATURE.

THE ACTIVE WORKER.

"What matters it though eighty years or more
Crowd close upon us, if in mind and strength
We hold our place intact in active life?
And then what matters when our work is done
If summons sudden come to call us home?

—HORATIO KING.

"GLEN MARY," THE OLD HOME OF N. P. WILLIS.—In MEEHANS' MONTHLY for October, the gem of poetry at the beginning of "Wild flowers and Nature" was from the pen of N. P. Willis,—called an "October Morn." I spent some months, the past season, close to the old home of the poet, and was in the house several times. Although the house has been remodeled, the room which he occupied and called his den has been kept as he left it, and I can imagine he wrote that lovely poem in this sunshiney room, with doors opening into porches east and west—broad hospitable porches they are, with creepers and clematis climbing over them in wild profusion.

The bridge, under which he wrote a series of letters, is gone, the stream having been filled in, and only a stone arch culvert takes the place of the bridge of long ago. But on the hill-side above the house, "The lub'ring herd was grazing upon the hill-side quietly," as in days agone. The wind whispered among the branches of the same old trees. At the foot of the garden, beautiful Owego Creek, calm and placid as a summer's day, kept on the even tenor of its way, pouring its waters into the Susquehanna not far away. Great maples, oaks and chestnuts cast their shadows into its clear waters; wild grape vines, clematis and creepers climb here and there in lovely abandon. Wild bits of scenery that would set an artist wild—gems of dainty beauty—poems of Nature.

On the hill, a little beyond the house, is the private insane asylum "Glen Mary."

The grounds are laid out beautifully; but much is left as Nature formed it. The most magnificent oak tree I ever saw is on these grounds. In rambling about the grounds, one comes suddenly to a weed patch among the trees—these are burdocks, yellow dock, thistles, mulleins and plantain in profusion. The trees are closer together—Nature is left to her own sweet way.

It strikes one as being out of the common order of things. A little further on, we come to a wooded ravine—a real tangle of wild beauty; further up are lovely falls and cascades; and in an enclosure are two graves where are buried some of the loved ones of the poet—away from the turmoil and strife of the busy world in this wild-wood glen they sleep. Beautiful "Glen Mary."

Conklin, N. Y. MRS. FREDERICK C. JOHNSON.

THE FOX-GLOVE.—That there is in botany and gardening a much wider scope for intelligent human pleasure than repeating hard plant names, or trimming a rose bush with a pair of shears, is well illustrated by a paper on the fox-glove, in the November number of the *Canadian Horticulturist*, by Mr. A. Alexander. He tells how, when a lad, he first was struck by the beauty of the blossoms from plants growing in the clefts of rocks near Dunsinane Hill, where Macbeth's Castle stood. But he afterwards found it at home everywhere,—even among the heather in sandy plains. Spikes were sometimes 4 feet high, with 100 bells on them. He thinks that the name, fox-glove, comes from the flower being like the fingers of a glove,—but like all authors omits to tell us how foxes wear gloves. To the writer of this paragraph, it has always seemed that "fox" was a corruption of some ancient word of very different meaning to fox of our time. Among other names, Mr. Alexander says that in the south of Scotland it is called *bloody fingers*, farther north, *deadmen's bells*, and on the eastern borders *ladies' thimbles*, *wild mercury* and *Scotch mercury*. In Wales the synonyms are *elve's gloves*, *foxes' gloves*, *red fingers* and *dogs' fingers*, and that the name of *Digitalis*, first given to the plant by Leonard Fuchs, in 1542, had reference to fingers,—and we should rather

look to fingers than gloves, possibly, for the meaning of fox-glove.

THE ENGLISH HORNBEAM.—A distinguished son of the commonwealth of Massachusetts, an idealistic lover of trees—Charles Sumner, once made an eloquent memorable appeal in the United States Senate, to the improvers of the Capitol grounds, to spare the splendid specimen of *Carpinus Betulus* growing about a stone's throw from the Senate chamber. Alas, his warning was in vain, for the tree is now dead! Its successor, planted by his friend, John A. Bingham, twenty-five years ago in the Botanic Garden, is a rather handsome specimen. Voltaire was a great lover of this tree. If, when you visited his home at Ferney, you did not admire the hornbeam hedges and trees, you were not invited back. It is much used for hedges and wind-breaks in France and Germany. W. R. SMITH.

NAPOLEON'S PALM TREE AT ST. HELENA.—The St. Helena Palm, which was valued so highly by Napoleon I, has been dead for some time. The Emperor often sat in its shade, dreaming of his glorious past.

It was Louis Philippe's wish to have this historical tree transferred to the botanical garden at Paris, but the project was never carried out. Now, the proud palm is sold for fire-wood. With it disappears from St. Helena the last remembrance of the Emperor. The house in which he lived, is fast crumbling away, and no one thinks of repairing it. The bed-room is used for a pig pen.

—From *La Semaine Horticole.*

LYRE FLOWER.—The class of plants known with us as Breeches-flower, of which the well-known *Dicentra spectabilis* is a type, is known in England as Lyre-flowers, from the resemblance to a lyre or ancient harp.

PURSH'S BOTANICAL LABORS.—A correspondent of the *London Journal of Horticulture* says that the *Hortus Cantabrigiensis*, by James Donn, had an edition prepared by Frederick Pursh.

GENERAL NOTES.

PLANTS POISONOUS TO CATTLE.—A Scotch paper says that the law in that country recognizes the following plants as poisonous to cattle: foxglove, hemlock, colchicum, henbane, wolfsbane, fools' parsley, dropwort, thornapple, monkshood, deadly nightshade, yewtree, laburnum, rhododendron, *Ranunculus acris*, and certain classes of mushrooms. There was a law case in which the foxglove, *Digitalis purpurea*, figured. Sixteen acres were rented for pasture, where there were 150 plants 4 feet high,—of 16 cattle turned in, 10 died. The tenant sued the landlord for the value on the ground that he should not have rented the pastures with poisonous plants on them. The verdict was for the plaintiff. It was a three days' trial with 68 witnesses. The plea of defense seems to have been that the landowner did not know the plants were poisonous, or did not know they were there. The court decided that ignorance was no excuse. In our country, we should think ignorance on the part of the tenant was as bad as ignorance on the landlord's part, and the decision would probably have been "six of one, and half a dozen of the other."

The *Florists' Exchange* records the fact of chickens being poisoned by seeds of *Bocconia cordata* which they ate. This is not to be wondered at considering the family relationship with the poppy, from a species of which opium is extracted. The *Bocconia* is known commonly as the Plume Poppy.

ENCOURAGEMENT TO TREE PLANTING.—The absence of trees on the original tree-less prairies, has stimulated methods for encouraging tree-planting. Arbor Day originated in Nebraska. Kansas is alive to the same good work. Early in the fall, the *Kansas City Star* announced that a real good hotel dinner should be given to any boy or girl who would plant a tree. On Thanksgiving Day, the Maitland House had to provide plates for 1,136 children. They were called "The little tree-planters." Such a sight as a grand hotel taken by storm by an army of joyful children, was probably never seen before on earth. A real hotel dinner, to be waited on by hotel waiters, in a grand hotel, will no doubt be something in connection with tree-planting that will make a lasting impression on the youthful mind.

BOTANIC GARDENS IN HAWAII.—The U. S. Government ought surely to establish two or more botanic gardens and arboretums in our newly-acquired tropical possessions.

C. W. G.

ECHINOCACTUS WHIPPLEI.

WHIPPLE'S ECHINOCACTUS.

NATURAL ORDER, CACTACEÆ

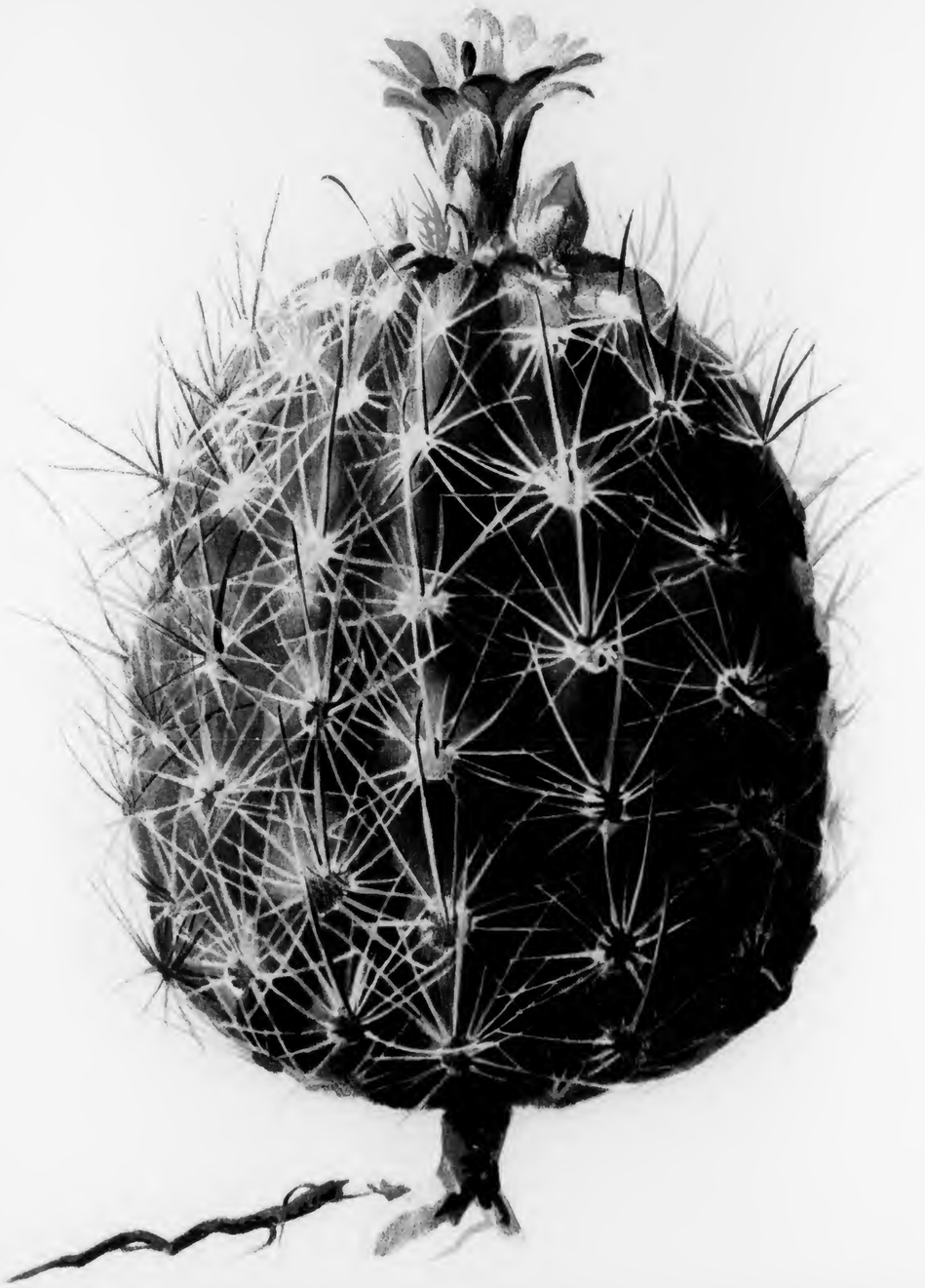
ECHINOCACTUS WHIPPLEI, Engelmann.—Heads solitary, globose or ovate, middle-sized, with 13-15 compressed and interrupted ribs; of the 7 to 11 outer and 4 inner spines, the ivory-white upper ones are the longest and broadest and recurved or twisted; the lower are shorter, darker, and terete, and the lowest middle one hooked; flowers one to one and a quarter inches long, yellow; few (one to five) rounded, fringed sepals on the ovary, ten to fifteen oblong ones on the tube; petals about eight, stigmas five to seven, short; seeds large, minutely tuberculated. Heads three to five inches high; spines three to twenty or twenty-four lines long, on prominent tubercles, which give the ribs a wavy or interrupted appearance. Watson's *Botany of the Geological Survey of California*.

As a rule there is no more constant character in a member of the cactus family than the color of the flowers. Cactuses are variable in many respects, but the flowers afford less varying characters than any other part of the plant. When, therefore, this beautiful specimen presented itself, with its bright purple flowers and large size, it was accepted as belonging to *Echinocactus Whipplei*, with some hesitation. Mr. Watson, in the description noted, gives yellow as the color of the flowers, as do some other authors. In the first description by Engelmann, in the report on the Botany of Whipple's Expedition, the flowers had not been seen. It was collected again during Simpson's Exploration of the great Utah Basin in 1859—but still without flowers, or at least the withered remains only were found. During Clarence King's expedition, in 1871, it was again found, and described by Watson as "greenish-red." That Mr. Watson makes no comment on the variation in color between the flowers in the plants of Utah and the plants of California, gives confidence as to the accuracy of the determination of our specimen as *Echinocactus Whipplei*. Specimens were collected in Southern Utah, and sent to Eastern gardens by Dr. C. C. Parry and Mr. A. L. Siler, of Kanab. The drawing was made from a specimen in bloom kindly furnished by Mr. Jackson Dawson, of the Arnold Arboretum. A marked character on which to rely is the fewer number of sepals and petals than are found in allied species. The broad green sepals of the tube are also characteristic. Its native home is Southern Utah, and South-eastern California.

The expedition of Lieutenant Whipple was for the purpose of surveying a route for a railroad between the Mississippi River and the Pacific Ocean. It was singularly prolific in good results, and botany particularly profited largely. The cactus family, especially, yielded up a very large number of species hitherto unknown,—some twenty-five species, wholly new, being described by Dr. Engelmann in the report of the expedition, this *Echinocactus* being one. Dr. Engelmann there says of it, "*E. Whipplei* evidently belongs to the section *Hamati*, found in numerous forms on the middle and lower Rio Grande; with *E. polyancistrus*, it is, so far as at present known, the only representative of this section this side of the Rocky Mountains. It is more nearly allied to *E. brevihamatus*, from Eagle Pass, the seeds of which are as yet unknown. It is, however, easily distinguished by the arrangement of the spines; the eastern species (*brevihamatus*) has eleven terete radial spines all around, and four central ones, the uppermost one being smaller and narrower than the lower hooked one. It was discovered on Lithodendrow Creek, near the Colorado Chiquito, about ninety miles west of Zuni, in sandy plains, December 3d and 4th, 1853."

What the uses are to plants of many of their organs is a prolific source of argument, and sometimes it would seem that those who contend that creation is one harmonious whole, and that each individual does not wholly work for itself but has some of its organs merely to aid in the good of the whole rather than itself, have some good ground to work on. Much, for instance, has been brought forward in relation to the use of spines to a cactus. It is assumed by those who contend that all organs are wholly to aid in "a struggle for life"

COLOR PLATE



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INTENTIONAL SECOND EXPOSURE

that the spines are merely for protection. Dr. Kennedy, the physician of this very expedition, observes: "We frequently passed the burrows of small quadrupeds, with their heaps of spiny cactaceæ piled over them to prevent the coyote from destroying them and their habitations. The long and barbed spines of these plants are sufficient to deter the wolf from committing his depredations, but the small rabbit (*Lepus artemesiæ*), not resorting to this important expedient for protection, often falls a victim to the rapacity of this animal by being chased or scented to its burrow and then dug out. The Jackass-rabbit (*Sepas callotis*), being much more swift than the small one, is less liable to be overtaken by its untiring enemy." It is sometimes said, in support of the more selfish view, that we can see that they certainly often do protect the living plant,—and it may with equal truth be remarked that we can see that they certainly often do protect other things.

This remarkably valuable scientific exploration had few soul-thrilling experiences, which occasionally serve to bring the prominent actors fame and an extended biography. Very little has been recorded of the able commander, and in whose honor this beautiful cactus, as well as some other flowers, were named. Even the date and place of his birth in Massachusetts does not seem to be of public record, but he died fighting for his country at the battle of Chancellorville, supposed to be about forty-six years of age.

A cactus plant seems an anomaly in the kingdom of flowers. A mass of cellular matter, with a comparatively woody centre, is all that such a plant as *Echinocactus Whipplei* presents to the ordinary observer, and yet it is formed on the same plan as any ordinary plant where distinct stems and leaves are constructed. Fortunately for those who love to be admitted into the secrets of nature, a study of the allies of any plant will often furnish the key to many a mystery. The gooseberry and currant are close relations of the cactus,—the fruit of the gooseberry, indeed, having few differing characteristics from those of the cactus. A study of the thorns of a gooseberry will suggest to us how the spines of a cactus might be evolved. If these were to become fleshy, and enclose the branch which made a start from the axil, and this branch in turn become so much arrested as not to reach—or barely reach—the apex of enclosure, we should have what actually occurs in the make up of the cactus. In the *Echinocactus* here portrayed, the downy mass at the apex covers the point we denominate the areole. This is the apex of the fleshy envelope that has encircled the arrested branch. The spines are arrested branchlets, and perhaps arrested stipular thorns. The flowers, which appear on cactuses, are in like manner arrested leaves and branches, which have to appear from some axillary point in a cactus, just as they would have to appear in any ordinary plant destitute of succulence. The point from which these arrested branches appear, often decides the genus to which the plant belongs. If it starts at, or just below, the areole referred to, and as seen in the *Echinocactus* illustrated, it is an *Echinocactus*,—but if it started from the base instead of the apex of the tubercle, it would be considered a *Mammillaria*. A cactus may therefore be wholly covered with long tubercles or mammæ and yet not be a *Mammillaria*. If the flower proceeded from any position on the tubercle itself, and not from the base, it would be an *Echinocactus*, or some other genus than *Mammillaria*. In the arborescent forms of cactuses, the pulpy succulent matter, which envelops the woody portion, parts as easily as bark from an ordinary tree, and its true relation is readily seen. The epidermis or outer skin is constructed so as to resist evaporation. What little moisture the plant requires is therefore easily retained, and it is thus not only able to provide for self-preservation, but to aid in preserving the lives of numerous creatures which, by burrowing under the sandy earth in which the plants grow, avoid the spines, and get a share of the moisture, which, we may reasonably suppose, nature provided for them as well as for the plant itself.

It is said that a species of the tortoise family is supported almost wholly, by boring under the cactuses, and getting their food in this surreptitious manner,—and that horses and mules that may have become wild on the arid plains where cactuses abound, have learned to get both food and moisture, by breaking apart these fleshy forms of cactuses with their hoofs, so as to reach the interior in spite of the spiny protection the plants present.

EXPLANATION OF THE PLATE.—A plant of rather large size, with a small portion of the root attached.

WILD FLOWERS AND NATURE.

LOOKING FOR SPRING.

The meadows don their green array,
The streams in purer currents flow;
On sunny knolls the lambkins play,
And sport amid the vales below.

The humble Anemone blows,
The blue-bird now is on the wing;
How soon will breathe the blushing rose,
How soon will all around be spring.

—PERCIVAL.

THE WINTER PLUMAGE OF PLANTS. — We have just had a week of warm, pleasant weather, and yesterday it was very nice and warm, comfortable without fires. I saw, flitting from post to post, Mrs. Jennie Wren. She was very busy hunting spiders on the shady sides of the pickets. She had her regular brown-spotted dress on, and she still wore her tail feathers long. To-day, the wind is from the North, freezing and growing colder all the time. I feel confident that Mrs. Jennie Wren is now on her return journey to the orange groves, helped and hurried along by this icy north wind. I took advantage of the pleasant weather and took several walks to the sand rocks to gather ferns and phlox and any other nice interesting forms of vegetation for my wildflower pit. I met with a new form of the Walking-Leaf Fern, *Camptosorus rhizophyllus*, in that it had its fruit dots on the margin in a single row without indusia, round and oval, with inconspicuous veins.

The stipes are very short, ½ an inch or less in length, many fronds to a plant, growing regularly from a common center and hugging the moss-covered rock closely. The fronds in their growing stages are blunt-(obtuse) pointed and short. This plant may have an indusium over its fruit dots in summer, but I see no signs of any now with a magnifying glass.

This plant is a most interesting one. It is new to me, and I was not aware of its growing on the sand rocks in this section, and the find was totally unexpected. Among the beasts of the earth, the birds of the air and the herbaceous growth of wood and field, we find some of each to change their summer plumage for a winter growth which is entirely different. The Ermine of the North grows a plumage suited to its snowy surroundings. The Reed-bird, Cow-bunting, Rice-bird, Bobolink, *Dolichonyx orizyvorus*, local names, all the same bird, has a different plumage for every season of the year. Among herbaceous plants, the *Phlox pilosa*, *procumbens*, *reptans*, *divaricata*, *bifida*, all growing here, yet each a little different in their markings, have a winter plumage and a summer one. The *Phlox pilosa* winter garment is evergreen,—large, round oval leaves blotched and spotted with purple, smooth without marginal jags or notches. A person seeing this *pilosa* in the summer would never recognize its winter plumage as the same plant. *P. bifida* winter garments are long, narrow leaves, 1½ to 2½ inches in length, colored pink-purple. whorled at their tops, stem bare of foliage. They are generally top-heavy, and are fond of lying on the ground, seldom erect. These plants begin to bloom in April and keep it up until midsummer, each species having a different time to bloom, yet the most of them are in bloom at one time. The *P. divaricata* is the earliest to bloom; this plant and the *P. pilosa* have the most fragrance. F. K. STEELE.

Festus, Mo.

WILD FLOWERS OF WISCONSIN.—The communication in the January number of your MONTHLY, by an anonymous correspondent, reminded me that I have been wanting to write to you for some time. I remember having read in an earlier number of the MONTHLY of New Jersey as a far-famed collecting ground for botanists, and wondered whether it is richer in floral treasures than some places in this State, which it has been my good fortune to visit last summer. The place referred to is a piece of rolling prairie, quite frequently found in the south-easterly part of the State, and the profusion of flowers on same was marvelous. They seemed to thrive best on the high ground, as

the low places are quite wet in spring and the species most abundant on the ridges apparently do not thrive below a certain level, where they would be exposed to the spring floods. We visited the place on May 30th. The first meadow we crossed was thickly carpeted with *Viola pedata*, *cucullata* and var. *palmata*, *Sisyrhinchium Bermudianum*, *Hypoxis erecta*, *Oxalis violacea* and *stricta* and *Comandra umbellata*. In good numbers, but not quite so plentiful, were found *Geum triflorum*, *Lithospermum hirtum*, *canescens* and *longiflorum*. Proceeding along the higher ground, we noticed some distance ahead large patches of a reddish hue, and on reaching them, were surprised to find them made up of *Castilleja coccinea*, growing there by thousands and forming patches several acres in extent. Among the plants were some of a deep scarlet, some yellow and some with bracts yellow at the base with scarlet tips. Yet another surprise was in store for us. The week previous, I made a trip to the Scuppernong Marsh, between Eagle and Palmyra, in this State, to get some specimens of *Cypripedium candidum*, which, I had been informed, grew there. I spent the entire day there and found three specimens. Afterwards, I learned that for years gardeners have taken up Cypripediums from that place, and exported them, and naturally they became scarce. We were therefore more than delighted to find at this place the long sought for Cypripediums. They grew on a part of the ridge, together with the Castillejas and *Dodecatheon Meadia*, and in such profusion that it was impossible for us to avoid crushing them as we walked along. They generally grew in little bunches of about half a dozen and the flowers were delightfully fragrant: Besides the above, we found there *Phlox pilosa*, *Valeriana edulis*, *Baptisia leucophæa*, *Vicia Caroliniana* and *Americana*, *Thaspium aureum* and *cordatum* and *Polygala Senega* in considerable numbers.

In July and in August, I visited the place again. The bright flowers of *Castilleja*, *Dodecatheon* and *Phlox* were faded and gone, but in their places had sprung up large colonies of *Allium cernuum*, *Petalostemon violaceum*, also *candidum*, *Amorpha canescens*, and acres of *Euphorbia corollata*, and the tall stalks of *Silphium laciniatum*, *terebinthinaceum* and *integrifolium* and *Eryngium yuccæfolium* were swaying in the breeze. With these mingled the brilliant colors of *Liatris scariosa*, *spicata* and *cylindracea*, and the graceful stalks of *Helianthus occidentalis*. In the moist places, we found *Lilium Canadense* and further on *Philadelphicum*, *Acerates viridiflora*, and *longifolia*, *Cacalia tuberosa*, *Parthenium integrifolium*, *Aster ptarmicoides*, *Linum rigidum*, *Asclepias Cornuti*, *incarnata*, and one which I took to be *Sullivantii*. In August, the yellow flowering Composites were predominating. *Rudbeckia hirta*, *laciniata* and *pinnata*, *Heliopsis lævis*, *Helenium autumnale*, *Helianthus rigidus*, *decapetalus*, *strumosus* and *tomentosus*, with *Eupatorium* several species, *Lythrum alatum*, *Hypericum perforatum*, *Desmodium acuminatum* and *Canadense*, *Lespedeza capitata*, *Cassia Chamæcrista*, *Campanula aparinoides*, *Lobelia spicata* and *Kalmii*, and *Gerardia purpurea* and *tenuifolia*.

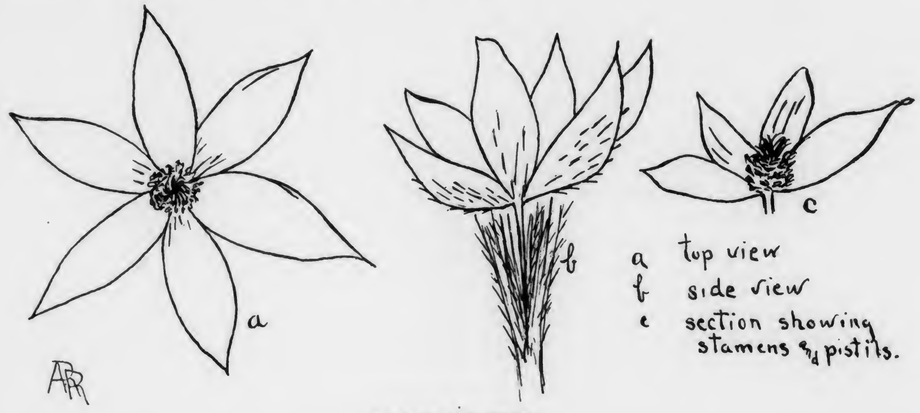
In September, the Asters succeeded the earlier composites, among them, *ericoides*, *azureus*, *Novæ-Angliæ*, *lævis*, *puniceus* and others, and with them came the Solidagos, prominent among them *S. rigida*, in all about 8 or ten species. The Rattlesnake Root, *Prenanthes alba*, also came into flower, and with *P. racemosa* and *aspera*, *Gentiana quinqueflora*, *detonsa*, *Andrewsii* and *puberula*, *Polygala sanguinea*, *Erigeron strigosum*, *Boltonia glastifolia*, *Parnassia Caroliniana* and *Spiranthes cernua* concluded the floral procession. W. F.

PINUS RIGIDA.—In regard to the name of *rigida*, the Rigid Pine, given to this species, Mr. C. F. Saunders, describing a visit in winter to the Pine Barrens of New Jersey, says :—

"In the white light of a January dawn, we sally forth down a frozen road of sand into the pines. Covered with their tufted green needles, the trees stretch away on every hand in long avenues of restfulness, with bushy seedlings, like little toddling children, clinging about their feet. These are principally, Pitch Pines—*Pinus rigida*—literally, the rigid pine. How well named rigid, one sees as he notices their action before a high wind. Where the White Pines would bend gracefully and toss their branches with an elastic motion, these rigid pines doggedly jerk backward and forward, their trunks stiff as ramrods from top to bottom, and as graceless, every branch tense and unyielding. The resistless blast forces them aside as it rushes along, but it cannot make them bow."

ANEMONE PATENS.—One of the advantages in change of location, to the student in Botany, is the new field for work which opens up before him. However, unless he is thoroughly acquainted with all the nooks and spaces about his own home he may find on his return just the same plants he has discovered, growing in some little unexplored corner, some hillside or some marsh near his own locality.

The botanist enjoys seeing and studying new species, growths, and combinations of plants in just the same way that the traveler enjoys seeing new countries and studying strange people. On the other hand, the return of the plants with the season, brings to the student the same pleasure that the greeting of



ANEMONE PATENS.

old friends and visits to old haunts do the returned traveler.

To the person living east of the Appalachian Mountains, a new friend may be found in the Pasque flower *Anemone patens*. This is a prairie flower not found east of Illinois.

I found it for the first time on April 7, 1894, growing on the prairie a short distance out of Winona, Minn. We left the city and followed the many children who are always anxious to get the earliest flowers. The anemones were thickly dotted all around us in the dead grass, which had been kept closely cut the fall before.

The leaf does not grow till the plant has finished blooming. It is like our Hepatica in that, but unlike the Hepatica the leaves of the Anemone are quite brown and dried, resembling the dead grass about them. Then, too, they are cut and divided into many narrow linear lobes.

Only one flower appears on the short peduncle. This is about two and a half inches across when expanded and of a delicate lavender. The number of sepals is from five to seven. They are darker on the outside and covered with soft hairs.

About an inch below the flower are a great number of slender bracts, one and a half inch long, which cover the flower in the bud, and in bloom extend beyond the receptacle. They, too, are covered with soft hairs.

The stamens are many, of different lengths and arranged around the numerous thread-like pistils. There is a pleasant, though not sweet, perfume.

Later in the season while out on a tramp we came across the Anemone in seed. The little peduncle had grown to a proud height, and bore on its summit a ball of beautiful feathery tails. Half-way down the stalk was the involucre which had protected so carefully the dainty flower while in the bud. Its usefulness was gone but it remained to add grace and beauty to the fruit now nearly ready to be borne about by the wind.

The only attempt I made to transplant it to eastern soil proved unsuccessful.

One of the common names I heard for it was Crocus. It has but a slight resemblance, however, to the Crocus and possesses none of the characteristics of the *Iridaceæ*.

Millington, N. J. ALLETTA R. RUNYON.

FREEZING OR NON-FREEZING OF SAP IN PLANTS.—In the December number of your magazine, which I have just been able to read after my return from a western trip, I notice with interest the article of Mr. Timothy Wheeler and the editorial comments upon the subject of the "freezing of sap in plants," which might, perhaps, be better titled, *the non-freezing of sap in plants*.

In the absence of cumulative evidence upon the subject, from actual, careful experiments, we can do little better than theorize about the matter. Truly there are "two sides," and the larger one is the blind side. However, there are some things we do really know touching upon the subject.

I have played and worked in maple sugar camps from my earliest recollection until a few years ago, and have often observed that all that a tapped tree seemed to require was a little external thawing to start it to running sap abundantly. A sharp freeze would seal up the surface of the wound whether made with the axe or augur. Maybe this was only the water of the sap which was frozen, and the part having sugar and mineral salts in solution did not freeze. I have often broken holes through the ice in an old-fashioned sugar-trough and drank the sweetened water below. When a thaw came after a cold snap in the sugar camp, which caught us with a lot of ungathered sap, we always threw away the ice, counting it a saving of so much water that need not be evaporated at the furnace.

As to cider, which is, as the editor says, "the sap of a tree," only the water content will freeze. How many times I have seen this tested. A barrel of cider left out in the fall, standing on end, and with no upper head, that was allowed to freeze and thaw, could be condensed the same as by boiling, and I was taught by my father to watch for such chances and throw out the ice as each thaw came on. We have thus made "boiled" cider at a very low temperature. I heard of a case where the cider had become "hard," (fermented), and some thoughtless boys drank so much that had been thus condensed in the bottom of a barrel, which they sucked out through long straws, poked down a hole punched in the ice, that they became drunk.

I have cut down many trees of all sizes, up to three feet or more in diameter, in Ohio, northern Michigan and Kansas, in winter-time, that seemed frozen to the heart. There was ice all the way from where my axe first touched the wood. The ice crystals were made from the water no doubt; while the true sap that remained within the living cell walls of the outer layers may not have been frozen. There is free water as well as true sap inside every tree, and it is my opinion that the former greatly predominates. It is as doubtful in my mind that the protoplasmic sap within the cell walls of a plant freezes without causing death as that the blood within the veins of an animal may freeze without death resulting. I have caught fishes through ice on the northern lakes that seemed to freeze as hard as chips of wood before I got them to the house. When I put them in cold water they thawed out and some of them were alive and swam about in a natural way. Others were dead and had doubtless been so deeply frozen as to no longer have living cells sufficient to renew the necessary functions of life. There is a limit of cold as well as of heat beyond which life cannot exist. This limit varies with the nature of the plant or animal. The high temperature that makes the Date Palm flourish would cause an arctic willow to die in a short time; and *vice versa*.

The physiological reason for death by severe cold that comes to tender succulent growth is something I would like to know. Is it from rupture of the cell walls? Actual freezing temperature is usually the limit of life, but it is not always so with many kinds of leaves and other apparently tender growth.

Will some one tell us why frost will kill a tomato leaf and not that of a cabbage or lettuce plant? What are the scientific changes or conditions occurring in each case?

Parksley, Va. H. E. VAN DEMAN.

From experiments that I have made, I am compelled to believe that the water of the sap freezes in all parts of the tree.

When the contents of the outer cells are known, the reason why no damage follows by freezing will be apparent.

The contents are water, sugar, air and gases. The water alone freezes, and of course expands, but the same law will equally contract the air and gases, thus equalizing or balancing the forces, so no damage is done. The sugar, of course, does not freeze.

TIMOTHY WHEELER.

Since the former notes appeared, the writer saw a number of bottles of ginger ale that had been exposed one night to a temperature of 12° above zero. Some two-thirds of the upper portion of the contents were of grumous ice. The lower portion was still liquid, but of an intense brown, and the saccharine character and gingery elements were intense. The ice when melted was merely water.

As suggested, the whole subject needs careful study. Some plants shrink under cold, as Mr. Wheeler says, as if they were allowing room for expansion, as in hardy cactuses and the rhododendron. They would furnish good material for microscopic examination. The stoppage of flow in the Sugar Maple, under severe frost, has often been used to show that "sap" does freeze, but as it flows again immediately on a thaw, it is not reasonable to suppose that a huge trunk, frozen through, could thaw out in a few hours. As conjectured in the foregoing articles, it is probably only the water in the sap at the orifice that freezes and stops the flow.

SEEDS' DISTRIBUTING ORGANS.—Your correspondent on *Xanthium Canadense* suggests as a possibility what I know to be a fact in reference to the dissemination of the seed in the hair of animals.

We bought a gray wolf robe more than fifty years ago, and entangled in the hair I found one of these spiny seed pods. I planted the seed and raised a plant and identified it, and then destroyed it, as we wanted nothing of the weed.

A few years later I found it quite common in waste places near woolen mills, and I think I am justified in charging this to the trade in western wools that began about that time.

As I begun botanizing more than sixty years ago, I have noted the arrival of many strange guests, not only from seedsman's stocks, but also from the U. S. Department of Agriculture.

West Cornwall, Conn. T. S. GOLD.

THE HART'S-TONGUE FERN.—Mr. H. E. Ransier writes to the *Manlius Eagle*, of Onondaga County, N. Y., that the Hart's-tongue Fern, *Scolopendrium vulgare*, has been found near Manlius, N. Y. A number of localities for this rare fern have been noted in different places since Pursh first observed it in New York.

YELLOW-BERRIED HOLLIES.—In MEEHANS' MONTHLY I noticed recently an article recording the existence of a holly bearing yellow berries. On my annual journey to the Gulf Coast, I have several times noticed such a holly at two different points on St. Andrew's Bay, Florida, and thinking perhaps you might be interested in seeing it, I to-day send you a few branches, together with a few branches of the red which grew adjoining. I cannot see any difference in the habit of the trees, though the leaves of the yellow seem to be a little narrower, and there are always a cluster of the shrubs, instead of the tree-like character of the red. The yellow berries are never oblong, like the red growing here, but are invariably round, and smaller than the red. G. M. WEST.

Escanauba, Mich.

Mrs. Thompson, of Spartanburg, S. C., also sends yellow-berried hollies,—but these are larger and rounder than the ordinary red form. Another correspondent inquires about propagating hollies. Some of the American species are barren. The berried plants should be grafted on young seedlings of the species. In selecting berried plants, it is well to select isolated individuals that can only seed through having perfect flowers. Some plants, wholly pistillate, will bear berries if in the vicinity of staminate ones.

BEES AND FLOWERS.—In reference to the paragraph in a recent number of this Magazine, in which Sir John Lubbock expresses a belief that the color in flowers is intended as a guide to insects in their search for honey, a correspondent says: "In this particular part of the world, wherever a small portion of fruit syrup is lying around, bees and other living insects will find it, although traveling a long distance in order to reach it. Sir John would probably suggest that the syrup should be enclosed within a colored circle in order to aid the bees in finding it. This may be a fact to the bees of the Old World, but the bees of this country evidently can readily find the honey secretions without having any colored surroundings to guide them in their search."

WILD VIOLETS.—Dr. LeConte made species of Eastern Violets, that the generation passing away abandoned as mere varieties. The younger botanists, are restoring some as good species.

GENERAL GARDENING.

GRANDMOTHER'S GARDEN

There is a constant, nameless grace
About the dear old-fashioned place
I never can forget.
I find it in the Hollyhocks,
And in the scented rows of Phlox,
The beds of Asters, fragrant Stocks,
And darling Mignonette.

The dear old flowers our grand-dams knew,
The dear old shrubs they loved and grew,
Still make it sweet and fair.
The modern grower, who insists
On novelties from seedsmen's lists,
With barbarous names by botanists,
Will find small pleasure there.

—*Westminster Gazette.*

SCARLET RUNNER BEAN AND HUMMING-BIRD FLOWERS. — Some southern readers of the MONTHLY have written to me concerning the Scarlet Runner Beans and Sun-flowers. They wish to know how I plant them, and also what northern blossoms will attract their native humming-bird. I promised, if space could be spared, to give my experience in your magazine.

The Scarlet Runner is, in Germany, called Turkey or Oriental Bean, no doubt from its being native of Said. It is the glowing color of their blossoms which attracts the humming-birds, which hover over them daily, and very often sip of their nectar. The vines are great runners, if given support enough, covering easily the second story windows if planted underneath them. My mode is to plant them every three feet apart in a hill,—2 or 3 beans in a hill,—and in the middle space between them some sun-flower seeds. If the latter come up, I leave only the strongest one standing, on which in due time, the bean vines twine and profusely bloom till frost in the autumn cuts them down. The little birds frequent only the bean blossoms. I have never seen them hover over the open sun-flower, but the effect of decoration is very good when these two kinds bloom together at the same time, which they do when planted at the same time. Last summer I put a few seed-

beans near a quince bush, and as they were high enough to climb on the pole I had set for them, they preferred to run up into the quince bush, and during the summer covered it all over its crown with hundreds of scarlet blossoms, making a most wonderful picture, which was admired by all who saw it. I shall do so again this coming summer. Sun-flowers are very much visited by the honey bees as also by the bumble bees. Autumn birds eat their seeds when ripe. The Yellow Hammer is one seen often, —also our domesticated proletarians of the street—the saucy, undismayed, English Sparrow. He comes in flocks to feed on it.

Of other flowers which the humming-birds here in our northern gardens frequent, there are notably the columbines, nasturtiums, gladiolus, cannas and the pretty scarlet Oswego Tea or Bee-balm, *Monarda didyma;* and on the roadsides, it is a constant visitor to the very pretty Jewel-Weed, *Impatiens pallida*. I noted, especially, that these little winged blossoms of the air (as we often call these birds while they so quickly hum over their flowers) do not pay much attention to sweet pea blossoms, although growing near Scarlet Runners.

Another northern scene, very novel to southern eyes, is our present deep snows all over the country, which drive the Blue Jay, our large winter bird, out of the woods, on account of scarcity of food, to seek the dried up apples which have been left on the trees near the house. MRS. WILHELMINE SELIGER.

Hartford, Conn.

The writer finds that by standing quite still among a mass of plants of the Jewel Weed, the humming-bird will rest on the shoulder, or even the hand if it be extended, and held quite still among the flowers. It does not seem to be able to detect the living man under these conditions, for it would surely fear to make such close acquaintance if conscious of the danger.

THE MODERN CONSERVATORY.—In former times, it was the custom, in the gardens of the wealthy, to have a greenhouse or greenhouses

and a conservatory. The greenhouses were generally placed in connection with other glass houses in some separate portion of the grounds, and when anything was in flower it was taken to the conservatory where it replaced the faded ones that were returned to the greenhouses. This is the origin of the term conservatory. It was attached to the dwelling house, and was indeed an essential part of it. No work on the plants was done there, but watering, heating, and ventilation. In modern times there is no distinction between the two terms. A greenhouse, large or small, for growing plants, if connected with the dwelling, is usually termed a conservatory.

A remarkably pretty one is attached to the residence of Mr. Charles W. Henry, of Wissahickon Heights, near Philadelphia, of which an illustration is given herewith.

The accompanying illustration of a small conservatory connected to a dwelling is one built by the well-known firm of Lord & Burnham Co., Irvington-on-Hudson. The plan of it is half a polygon connected to the house by a straight section, the extreme width being 42 feet, and its depth about 32 feet. On either side the straight section, which is about twelve feet wide, opens out through double doors upon a piazza. The conservatory is used for growing palms and other ornamental plants and presents a very attractive appearance as seen from the dining room through a number of large windows extending down to within a few inches of the floor. One of these is used for

CONSERVATORY OF C. W. HENRY, Esq.

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CONSERVATORY OF C. W. HENRY, Esq.

INTENTIONAL SECOND EXPOSURE

access into the conservatory and is provided with two swinging French windows. Such a conservatory is a very attractive addition to a dining room, and as it has a very well adapted system of direct radiation by means of which the temperature may be regulated to that of the house, the windows connecting it with the dining room may be thrown open, allowing the odor of sweet flowers to fill the whole house.

Mr. Henry is one of the Commissioners of Fairmount Park, Philadelphia, and is a rare lover of gardening. Besides the conservatory, he has quite a range of glass covering grapes, peaches, violets, vegetables, and miscellaneous stock.

THE AMERICAN GINSENG (PANAX QUINQUEFOLIA.)—The United States exports annually something over 25,000 pounds of Ginseng at an average price at present of over $3.00 per pound, or an aggregate of nearly one million dollars per year.

Practically speaking, China is the only market for it; all we sell reaches the Chinese directly or indirectly. These people believe it possesses properties or has the power to alleviate every suffering the human race is heir to. It is said to be administered in almost every description of disease; that "it is a sovereign remedy for all weakness occasioned by excessive fatigue, either of mind or body; that it cures weakness of the lungs and pleurisy; that it stops vomiting, strengthens the stomach and helps the appetite; that it disperses fumes or vapors; that it is a remedy for short and weak breathing and strengthens the vital spirits; that it prolongs life in old age," in short they affirm it makes man immortal if anything on earth can do so. While they regard it as a panacea, their faith is based wholly on fanciful grounds, for other nations esteem it of but little medical value.

There are several species. The Manchurian or "Imperial Ginseng" is the most highly prized, chiefly because of its fancied resemblance to the human form. The main root represents the body, a fork which it often makes represents the legs, the side roots furnish the arms and shoulders, while the stem supplies the head and neck. The more complete this likeness, the more virtue the roots are said to possess. The district where it grows has long been guarded by Imperial authority, while its collection and dispensation are governed by agents of the Sovereign. Choice large roots of the desired shape are worth their weight in gold and often bring as much as $300 to $400 per ounce. The general bulk of this variety ranges in price from $50 to $200 per pound.

The Korean variety stands next in their estimation, averaging in price about $20 per pound. It is similar to the Manchurian Ginseng but more plentiful. The Japanese and native grades are not in much demand except by the cunning dealers who use it to adulterate the better grades, for here as everywhere else, "for ways that are dark and tricks that are vain the Heathen Chinee is peculiar."

Our American Ginseng commands a price at from $2.00 to $6.00 per pound, dependent largely upon the size and appearance of the roots. The demand seems as great as the supply and the market is promising at least for several years to come.

Culture:—The steady decrease in the supply of the wild Ginseng and the increase in the price have stimulated attempts at its culture in this country for many years, but so far as I am able to learn, never, until recently, has any effort been rewarded with any degree of success. Within the last few years, however, practical and scientific experiments have been made sufficiently to prove beyond doubt that it can be cultivated profitably.

Ginseng is indigenous to the woods, luxuriating in shade, rich, loose soil and cool air, with a protection of leaves or brush during winter. Under cultivation, the more nearly these conditions are adhered to, the more complete will be our success. Then, evidently, the best location for the beds is in the forest or orchard. If planted in the woods, the ground should have preparation, the crop protected and given a chance if we expect favorable results. True, seed scattered in the wild brush, and left to fight the battle alone, will, in the course of time, give us a crop; but in this as everything else we are rewarded in proportion to our efforts.

Clear out sufficient of the undergrowth to admit of freedom to work, and pulverize the soil to a depth of two inches, plant the seed either by sowing broadcast or in drills and cover an inch deep. Keep watch over the patch not allowing the young plants to be choked out by too free a growth of weeds, etc., but do not stir the soil. See that the crop is not destroyed by stock or carried off by persons digging the wild root.

To cultivate in the garden our first attention should be the soil. Select light, rich, loose soil or make it so by hauling partially decayed leaves and virgin soil from the woods and adding liberally well-rotted horse or cow manure. It may be grown either in beds or patches. If in beds, plant the seeds in drills two or three inches apart and one inch apart in the drills. Cover one inch deep, and firm the ground well. When the plants have grown large enough to become crowded, thin out to six inches apart, transplanting those taken up to other beds.

If sown in patches where it is to grow until dug for the market, have the drills a foot apart and plant the seed five or six inches apart in the drills.

The only cultivation after planting is to keep the weeds pulled out. Do not stir or hoe the soil, but keep it loose by an occasional coat of hen manure or leaf mold.

The best time to plant seed is in October and November. They ripen in August and September. After being gathered, they should be kept continually moist until planted. If once allowed to become dry, they lose their vitality and will never germinate. If kept damp until planted, nearly every one will germinate, though seldom the first year after planting, so do not be disappointed when you sow seed this fall, if you have to wait eighteen months to see the young plants coming up. There are about 500 seeds in an ounce, sufficient to sow a bed 3 x 4 feet.

Having prepared the ground and sowed the seed, some means of protection and shade must be provided. Generally, the wits of the owner can suggest a plan that will be more economical to himself than that of any other, each person utilizing the means most convenient to himself. We find this an excellent plan. As soon as the seeds are sown, throw on a lot of brush, leaves or litter to afford protection over winter, keeping always a keen lookout for mice and ground squirrels. At the approach of spring, set in posts eight or ten feet apart and four feet high and on these make a cover of laths, brush, or other convenient material for shade. Hop vines planted and trained over this scaffold will make an excellent permanent shade.

With proper care, the roots will be ready for market at three to four years' old, or longest at five or six years. A well-grown plant will produce 100 seeds and yield a root which, when dried, should weigh an ounce.

To bring the best prices the roots must be large, free from bruises, washed clean and well dried. In the process of drying, roots lose about two-thirds their weight.

To have a rotation of crops, a new bed should be sown every fall. Then, as the plants are taken out of the old beds for market, their places may be filled by young ones from the new beds.

I am of the opinion that Ginseng will in a great measure, yield its wild habits of growth to the wily hand of the culturist; and may, after several years of patient selection and attention, be made to thrive in partial shade or full sunshine. In fact we have grown specimen plants without shade and to a great degree of success, by giving the young plants full shade and gradually removing same as the plants grow older.

The Ginseng and its culture are not thoroughly understood and still affords abundant opportunity for study and experiment.

GEO. B. MOULDER.

In regard to the growth of Ginseng in the full sunlight, it may be noted that when the writer, with a party of friends, made a wagon trip through the mountains of Virginia, Tennessee and North Corolina, in the garden of a farm house where they were hospitably received one night, Ginseng plants were growing with the greatest luxuriance in the farm garden in full exposure, as all the other denizens of the patch were. It is clear the plant has no natural aversion to full sunlight, if other conditions are favorable.

CLIFTON PARK, BALTIMORE.—Permit me to correct the erroneous impression produced by the statement, (found in the interesting biography of Mr. Wm. Saunders, in the January number of the MONTHLY) that "the beautiful Clifton Park (is) now Johns Hopkins University." It was so intended to be, the late Johns Hopkins having on more than one occasion so stated to the writer; but the Trustees, in whose

charge the matter was placed by the Will of Mr. Hopkins, exercised the discretion given them with the result that the buildings of the University are located in the heart of the City of Baltimore, whilst Clifton, which, by the extension is now within the city limits, has become, by purchase from the Trustees, the property of the City of Baltimore, for use as a Public Park, for which purpose it is undergoing changes which, if the numerous complaints which have appeared in public print have any foundation, must cause pangs of regret in the breast of Mr. Saunders: these protests being urged against what is claimed to be the wanton destruction of many of the valuable trees which have heretofore adorned the beautiful property.

J. HARMANUS FISHER.

NEW OR RARE PLANTS.

GAILLARDIA GRANDIFLORA COMPACTA, — DWARF BLANKET FLOWER.—It is just about a hundred years ago that the beautiful denizen of what were then known as the American Western plains, *Gaillardia pulchella*, was made

GAILLARDIA GRANDIFLORA COMPACTA.

known to European botanists, and given the name it bears. Since then, other still more beautiful species have been discovered in different parts of the North American Continent,—notably, *Gaillardia aristata*. This was collected by those eminent explorers, Lewis and Clark, in the Rocky Mountains, during their famous expedition across the Continent. German florists have improved it amazingly, and under the name of *Gaillardia grandiflora*, have brought them to be among the most popular of our hardy herbaceous plants. We say "them" because there are numbers of varieties, and it seems more are to come. The usual forms have somewhat a sprawling character; the one now illustrated is remarkable for a dwarf compact form which will make it very acceptable for certain positions in the flower garden.

ANTIGONON LEPTOPUS. — A correspondent from Crown Point, Indiana, remarks: "I was much interested in Mr. Jordan's words about the *Antigonon leptopus* in the December number. How can the ordinary amateur know how incorrect the statements may be of certain firms who have an apparent good standing?—and the busy amateur forgets the failures —fortunately for the seller of novelties. Could we not hear from Mr. Jordan's friend in Mobile, concerning his *Antigonon*? I did not suppose that bananas were hardy in Mobile. The only plant of *Antigonon* that it has ever been my good fortune to see, was in luxuriant bloom in the cemetery at Nassau, (Bahama Islands) in January of '92. It was clambering over an old-fashioned iron railing, and was at least 15 inches broad at the top, a solid mass of bloom, of a most vivid coral pink—a very beautiful sight, but not at all such a grower as the catalogues illustrate—no real tendrils, and not really graceful, because all parts of the vine have a certain thickness. It was difficult to find a spray suitable for a pressed specimen."

PHYSALIS FRANCHETTI.—It is evident that if we had more space, much more of interest might be said on *Physalis Franchetti*. On the table is a very good note from Mr. C. L. Jordan, of New York. He makes a fair point, that if a plant is only good under special conditions it is hardly fair to represent it as adapted to general culture. He thinks those who fail under these representations have a right to complain.

EVALINA—A WHITE CARNATION. — It has been the serious endeavor of florists for some years past to produce a good, white carnation. Lizzie McGowan is a good producer, and was largely grown, but flowers were not large and the plant weak-growing. Flora Hill came and was in one sense an improvement; the flowers were large and full, but the stems too weak. In 1897, Alba Superba was introduced, and in growth and stem it was all that could be desired; for other qualities, its value has yet to be determined. Evalina has the appearance of being a popular candidate. Its stems are sufficiently stiff and long,—the plant vigorous, and productive.

BOTTLE-BRUSH FLOWER.—A not inappropriate name for the genus *Metrosideros* is Bottle-Brush Flower, the flowers being grouped on the stems peculiarly like the household brushes used for cleaning out lamp-chimneys or bottles. The wood is very hard, giving it also the name of Cape Ironwood. The flower spikes are useful for cutting, and may be produced in the greenhouse from November on. *M. semperflorens* was exhibited at the Philadelphia Chrysanthemum Exhibition last fall, and attracted considerable interest. Though of the class of hardwood Cape plants, usually difficult to cultivate, these are comparatively easy.

CIBOTIUM SCHIEDEI.—One of the best ferns for decorations is the Mexican tree-fern, *Cibotium Schiedei*. It is of a light green color, and of open-spreading character. Mr. Henry A. Dreer, of Philadelphia, has been chiefly instrumental in giving it prominence. At the recent annual exhibition in Philadelphia, this, combined with other ferns, of which Mr. Dreer's collection is large, formed one of the finest exhibitions of this class ever staged in Philadelphia.

NEW HYDRANGEAS.—We notice, in the latest catalogue of Wilhelm Pfitzer, of Stuttgart, three new varieties of the hydrangea: *monstrosa*, which has large umbels, of a pretty reddish pink tint; *compacta*, large umbels with enormous pinkish lilac glossy flowers; *Souvenir de Claire*, with umbels like that of *monstrosa*, except that the flowers are a magnificent deep pinkish red.

—From *La Semaine Horticole*.

THE HARDY FLOWER GARDEN.

LEUCOJUM ÆSTIVUM,—THE SUMMER SNOW-FLAKE.—Few hardy border flowers are more acceptable than the summer Snow-flake, blooming, as it does, in the middle of summer when other border flowers are scarce. Many take it to be of the lily family as they see it growing, but it really belongs to the Amaryllis tribe. In the former class, the perianth is outside the seed vessel, while in the latter the fruit is below the floral envelopes, as seen in the illustration, which is taken from the London *Gardening Illustrated*, though the plant has long been a favorite in American gardens. The flowers are white with a greenish spot on the tip of each petal. It is a native of north-eastern Europe.

This dainty little flower has several charms of considerable utility,—the successive appear-

THE SUMMER SNOWFLAKE.

ance and opening of the flowers, which are at first concealed within the green sheath, and their lasting power and especial adaptability for cutting purposes. Cut and placed in water when the first flower or two opens, others will open before the others fade. The flower spikes are from six to eight inches tall and stiff, only the flowers drooping gracefully.

TEMPERATURE AND THE BLOOMING SEASON. —Connective with the paragraph in the September number of MEEHANS' MONTHLY, it may be noted as among the difficulties of constructing floral characters, that not only will plants bloom later than others in some seasons and earlier in others, but plants, themselves, vary the same season. In my garden, I have a dozen plants of the beautiful summer hyacinth,

Galtonia candicans. They commenced to bloom in the beginning of July and were wholly out of bloom by August 1st. But at the latter date, three plants, two of which had not hitherto flowered, sent up two extra strong shoots, which kept up the bloom till September. I had thought they must be marked varieties but for the fact that one of the three started from a root-stock that had already bloomed. M.

Philadelphia.

FRUITS AND VEGETABLES.

CUCUMBER CULTURE. — Mr. A. H. Hill, Keene, New Hampshire, writes under date of January 3rd :—

"Can you tell of the application of Nitrate of Soda to the cucumber? I have, in my cucumber house, four (4) water tanks, 4 feet 5 inches long, 18 inches wide and 17 inches deep, from which I water so as to use liquid manure of a temperature of 72°. How much Nitrate of Soda should I put in those tanks, each? I am a great believer in liquid manure. I ship my cucumbers to New York City,—sent my first 100 yesterday for this winter. Thermometer here yesterday was from 30 to 42° below zero, mine 35° above."

The conductors have had no experience with Nitrate of Soda as suggested. There are many expert cucumber growers among the readers of the magazine. Possibly some have had the experience desired.

BANANAS. — In the issue of MEEHANS' MONTHLY for January, an interesting article on the banana arrests my attention. As I have at this time a young banana tree—a three-year-old sucker—with a fine bunch of fruit on, and its mother and grand-mother likewise bore fruit of an excellent quality, I hardly understand, if I understand the article aright, why bananas do not fruit under glass. The plant in question always remains in the cool house. Thermometer during the day is 50° to 55°,—at night, falling often to 45°. It is never taken out in summer to be beaten by storms and wind-lashed. After having been taken from the mother plant, while she was bearing fruit, it was given a large tub, where it grows vigorously, and *this*, is three years from parent. The long flower stem has hundreds of flowers, but my plant usually matures about 70 to 80 well-formed, small bananas, which are much more finely flavored when allowed to ripen on the stem.

If this is a rare specimen, I take much pleasure in calling your attention to it, and would be glad for you to see it.

Sharon Hills, Pa. MARY B. CONARD.

Very common in greenhouses is a comparatively dwarf variety of the Chinese Banana, *Musa Cavendishii*. This is probably the one our correspondent cultivates. The large banana of commerce, and the one in mind when the former paragraph was written, is *Musa sapientum*.

THE CURCULIO OR PLUM WEVIL.—A Philadelphia correspondent says, in reference to what has recently been said in MEEHANS' MONTHLY about the Plum Wevil :—"Where did this destructive insect come from, and when introduced? Is it not true that there was none of this trouble about Philadelphia in the early part of the century?" There seems to have been localities that had not been discovered by the curculio, in different parts of the country, in the early part of the century, as there is even to this day; but in a general way, the insect seems to have been with us from all time, — not abounding, probably, because its desirable food or egg-raisers did not abound. John Bartram, in a letter to Peter Collinson, dated April 12, 1746, notes that up to that date the Sloe, a species of plum, had been "in the country these fifty years. The blossoms are prodigious full, but never one ripe fruit. They are bit with the insect, as all our stone fruit is but the peaches,—and some kinds of cherries do over-grow them." This carries back our correspondent's date for Philadelphia by one hundred years.

GRAPE FRUIT.—The *Citrus Aurantium* the orange, *Citrus Medica* the lemon, and *Citrus decumaria* the Shaddock, represent a family of which tropical Asia may be proud to count among its native plants. The one now illustrated is one of the most beautiful of these worthy members of the Shaddock family, as all those who have seen the trees as they grow in Florida will testify. They are known to northern people as Grape-fruit, though we believe the most common name among the growers is pomelo. The name Grape-fruit has been a puzzle to even clopœdists, who tell us it is because the fruit tastes like that of grapes. The writer could never detect such a resemblance. It is more likely to have been suggested by the round fruit hanging in clusters like grapes, so different from its sister species, the orange and lemon. In like manner, the family name Shaddock is in dispute, some saying it was some one named Shaddock who first introduced this Asiatic plant to the West Indies. There will be no difference of opinion, however, as to the beauty of our picture which is taken from a photo kindly furnished by Messrs. Anderson and Price, Ormond, Fla.

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INTENTIONAL SECOND EXPOSURE

BIOGRAPHY AND LITERATURE.

A MARCH DAY IN ITALY.

The sky was blue; without one cloud of gloom,
The sun of March was shining brightly,
And to the air the freshening wind gave lightly
Its breathing of perfume.

—LONGFELLOW.

NOMENCLATURE.—I am sorry to learn that my notes on page four of the January number gave any trouble to the publishing force of the MONTHLY.

I used the names that are sanctioned by good authority and those that seem to be destined to designate in future the plants referred to. I might have included synonyms but considered that it would be an imposition on space. The synonomic names of *Symphoricarpos Symphoricarpos* are given in Britton and Brown's "Illustrated Flora," Vol. III, page 236, and the same is in the catalogue of the plants of Northeastern U. S., as authorized by the botanical section of the American Association for the Advancement of Science, page 306. The latter was published by the Torrey Botanical Club of New York City and the former by Chas. Scribner's Sons, New York. The synonomy of *Cebatha Caroliniana* is also given in the works named. If all will consent to use *Index Kewensis* as standard and will bring all plant names to that or any other work of equal value, I shall be happy to agree. The botanist in America to-day needs no less than six catalogues of plants and an equal number of dictionaries in order to intelligently carry on his work, and sometimes even these fail to give the desired information. E. E. BOGUE.

Several correspondents have written to the same effect as Mr. Bogue,—but the main point made in the original criticism still holds good, namely, that the names questioned are not in the general dictionaries, which must be referred to by employees in printing establishments, and the general public who are not botanists, and yet must have at hand works of reference on general topics. If such a one, for instance, becomes interested in some popular story about the Indian Currant, he is not expected to look up "six catalogues" or a report of the American Association, "page 306," but he goes to the general library, and is handed down a dictionary. He will not find the "catalogue" name there. At the present time, the only dictionary of the plants of the whole world with their synonyms down to date is *Index Kewensis*. Britton and Brown, and others cited, are excellent authorities. They are undoubtedly correct in their position that many of the names they propose to be adopted should have been adopted. But they have a hard task in trying to upset the accepted nomenclature of the whole world, throwing everything into confusion, and utterly demoralizing general literature, because some generations ago somebody blundered.

In every other affair of life,—even to the collection of an honest debt,—there is a period when it becomes outlawed. The justification is that by the failure of the creditor to collect in time, too many innocent interests become involved. In like manner, there can be no reason why thousands should be made to suffer by a change in plant names, because credit for the original was suffered to sleep for a century.

ALFRED BRIDGEMAN.—The firm of Alfred Bridgeman, Seedsman, of New York, is another instance of the long-continued business of a worthy founder. Thomas Bridgeman was an English gardener, born in Berkshire, who came to New York in 1824, leased land on what is now 874 Broadway, and at once built greenhouses, and sold seeds. Like so many of the gardeners of the Old World, at that date, he was a man of broad intelligence, and he wrote valuable works on fruits, vegetables and flowers. His "Young Gardener's Assistant" went through several editions, and has a good sale even unto this day. He died in 1850. His son, Alfred Bridgeman, succeeded to his father's business, and well maintains the father's record. At present, Mr. Bridgeman gives his personal interest to the greenhouses aud nursery at Astoria. Mr. Geo. Lorenz is the manager of the city seed house.

SOLIDAGO NEMORALIS.

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GROVE GOLDEN-ROD.

NATURAL ORDER, COMPOSITÆ.

SOLIDAGO NEMORALIS, Aiton.—Stem often corymbose at the summit; leaves spathulate-oblong and oblanceolate, renate-serrate, or entire, roughish-pubescent. Darlington's *Flora Cestrica*. See also Gray's *Synoptical Flora*, Gray's *Manual of the Botany of the Northern United States*, Chapman's *Flora of the Southern United States*, Wood's *Class-Book of Botany*, and Britton and Brown's *Illustrated Flora*.

The plan of this work is to give in the first place pictures of our native flowers, botanically accurate, and as nearly perfect artistically as the drawings can be made,—and in the next place to take them as object lessons in the broad field of human interest wherein the plant illustrated may have a share. In this instance, the description of the pretty golden-rod illustrated is taken from the local Flora of Chester County, Pennsylvania, by Dr. Darlington, because the specimen chosen for the drawing grew in the adjoining county,—and, mainly to draw attention to the different methods employed by botanists in describing plants.

The one botanist, above all, who has studied the family of the golden-rods, is Professor Asa Gray. In his "Synoptical Flora of North America," he describes seventy-four species, besides a large number of varieties so markedly distinct from their parent species, as to be worthy of distinctive botanical names. His description of the species under consideration is as follows:—"Mostly low, with a fine and uniform close pubescence either soft or (in age and in dried specimens) minutely scabrous: leaves from spatulate-obovate to oblanceolate or somewhat linear; upper entire and small (half-inch or more long); radical and lower cauline sparingly serrate: thyrsus and its compact racemiform clusters secund, commonly recurved-spreading: heads two or three lines long: bracts of the involucre oblong-linear or narrower, obtuse, smooth and glabrous: flowers (appearing rather early) deep yellow: rays 5 to 9, usually more numerous than the disk-flowers: akenes closely pubescent." The difference in the length of the two descriptions for the same species is striking. But the larger number of species in Dr. Gray's work, makes a different method of treatment necessary. Dr. Darlington has but sixteen species to describe to us, while Dr. Gray has seventy-four. We speak of artificial systems of botany, and of natural systems. But all systems are made up of both classes. Though we can arrange plants so that there are groups with so close affinities that we can place them in orders, genera, and species, we have to use artificial lines in dividing them. This is particularly true of species. No one can positively define a species. The descriptions are merely comparative. For all the elaborate detail of Dr. Gray, no one could positively identify the *Solidago* here outlined if he had never seen one of the seventy-four species described. He would have to see others, or compare the plant with herbarium specimens before absolute certainty could be reached. If there were but two species of golden-rod, "flowers few, spicate," and "flowers numerous, corymbosely panicled" would be considered a valid description for either. But such a brief description would not entitle an author to a name for a seventy-fifth species, where seventy-four had already been described. We learn from this that the methods of description are in the main artificial; are dependent on the number of species in the genus to be described; and that there is nothing definite that will cover the idea of a species in nature.

A large genus, like *Solidago*, has to be divided into artificial sections, in order to make descriptions intelligible. In the limited list of Darlington's *Flora Cestrica*, he would first make a section with the racemes secund,—that is, the flowers all turned to one side, and spreading out from the rachis or common peduncle or even recurved. Then there would be sub-sec-

COLOR PLATE

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SOLIDAGO NEMORALIS, Aiton.—Stem often corymbose at the summit; leaves spathulate oblong and oblanceolate, renate serrate, or entire, roughish-pubescent. Darlington's *Flora Cestrica*. See also Gray's *Synoptical Flora*, Gray's *Manual of the Botany of the Northern United States*, Chapman's *Flora of the Southern United States*, Wood's *Class-Book of Botany*, and Britton and Brown's *Illustrated Flora*.

The plan of this work is to give in the first place pictures of our native flowers, botanically accurate, and as nearly perfect artistically as the drawings can be made,—and in the next place to take them as object lessons in the broad field of human interest wherein the plant illustrated may have a share. In this instance, the description of the pretty golden-rod illustrated is taken from the local Flora of Chester County, Pennsylvania, by Dr. Darlington, because the specimen chosen for the drawing grew in the adjoining county,—and, mainly to draw attention to the different methods employed by botanists in describing plants.

The one botanist, above all, who has studied the family of the golden-rods, is Professor Asa Gray. In his "Synoptical Flora of North America," he describes seventy-four species, besides a large number of varieties so markedly distinct from their parent species, as to be worthy of distinctive botanical names. His description of the species under consideration is as follows:—"Mostly low, with a fine and uniform close pubescence either soft or (in age and in dried specimens) minutely scabrous: leaves from spatulate-obovate to oblanceolate or somewhat linear; upper entire and small (half-inch or more long); radical and lower cauline sparingly serrate: thyrsus and its compact racemiform clusters secund, commonly recurved-spreading: heads two or three lines long: bracts of the involucre oblong-linear or narrower, obtuse, smooth and glabrous: flowers (appearing rather early) deep yellow: rays 5 to 9, usually more numerous than the disk-flowers: akenes closely pubescent." The difference in the length of the two descriptions for the same species is striking. But the larger number of species in Dr. Gray's work, makes a different method of treatment necessary. Dr. Darlington has but sixteen species to describe to us, while Dr. Gray has seventy-four. We speak of artificial systems of botany, and of natural systems. But all systems are made up of both classes. Though we can arrange plants so that there are groups with so close affinities that we can place them in orders, genera, and species, we have to use artificial lines in dividing them. This is particularly true of species. No one can positively define a species. The descriptions are merely comparative. For all the elaborate detail of Dr. Gray, no one could positively identify the *Solidago* here outlined if he had never seen one of the seventy-four species described. He would have to see others, or compare the plant with herbarium specimens before absolute certainty could be reached. If there were but two species of golden-rod, "flowers few, spicate," and "flowers numerous, corymbosely panicled" would be considered a valid description for either. But such a brief description would not entitle an author to a name for a seventy-fifth species, where seventy-four had already been described. We learn from this that the methods of description are in the main artificial: are dependent on the number of species in the genus to be described; and that there is nothing definite that will cover the idea of a species in nature.

A large genus, like *Solidago*, has to be divided into artificial sections, in order to make descriptions intelligible. In the limited list of Darlington's *Flora Cestrica*, he would first make a section with the racemes secund,—that is, the flowers all turned to one side, and spreading out from the rachis or common peduncle or even recurved. Then there would be sub-sec-

COLOR PLATE
INTENTIONAL SECOND EXPOSURE

tions in which the heads are "rather large," "rather small," and "middle sized." It may be seen by this arrangement that the student would have to be acquainted with some one or more species, before he could decide on the value of these comparative terms. With this knowledge gained, the brief description of the species becomes more intelligible. Our species would come under the "middle-size flower" section.

In Dr. Gray's arrangement, notwithstanding the elaborate description as already given, the student would have to go back to a number of divisions under sub-sectional, sectional, and tribal heads. In addition to the points already given, he would have to note that it was associated with others, that are "cinereous to canescent with fine and soft or at length minutely scabrous pubescence, and leaves firm but seldom very rigid,"—and to a section in which the characters to be noted are as numerous as those which are given under the discription of the species itself. He has to go back still further to a division which is styled the *Paniculatæ*, which has an equally long diagnosis. But further back still we come to the divisional character under the head of *Virgaurea*,—or those species of *Solidago* having the "receptacle of the head alveolate,—rays commonly fewer or not more numerous than the disk-flowers." It is very interesting to note that for all the fulness of description which this method involves, nature refuses to be circumscribed by it. In Texas, Lindheimer discovered a form with more disk-florets than rays, and which DeCandolle named *Solidago decemflora*, or the ten-flowered,—and the ray-florets so very small, that it comes nearly being discoid. But Dr. Gray is forced to give it as a synonym of *Solidago nemoralis*. Even the generic character will not be circumscribed. Of the whole genus, it is said "Flowers yellow, or in one species whitish in the disk, and white in the ray." But it is recorded in vol. 17 of the "Bulletin of the Torrey Botanical Club," that near Elizabethtown, Essex Co., New York, a plant of the species now under consideration had been found having purely white instead of yellow rays!

Our species, *Solidago nemoralis*, enters largely into the beautiful American autumn scenery known as "Indian Summer", so well noted by many, and Miss Embrey especially so well describes:

"But in that season, when the haze
The purple light the distance fills
As if old autumn in his flight,
Had dropped his mantle on the hills,—

When forest trees, with regal pomp
Their wealth of gem-like leaves display
And earth in gayest garb puts on
The glory that precedes the day."

It is among the earliest of the species—and indeed of Autumn flowers—to usher in the season of these glorious days. It seems to delight in comparatively dry soil, and, if it can find a field which the cultivator has abandoned, it will be but a few years when it will cover the whole surface with its "golden mantle." It is one of the most widely distributed of all American species, nearly all of which indeed are American. It is found in comparative abundance over the whole of eastern North America, entering even Northern Mexico. Though prevailing in so many localities under a great variety of conditions, the variations, from what would be termed the typical form, are not numerous. One of these only is sufficiently marked as to be regarded by Dr. Gray as worthy of distinctive rank as *Solidago nemoralis*, var. *incana*. This variety is of dwarf habit, rather more downy than the typical forms, and confined to the Rocky Mountain region from Dakota to the Mexican boundary line. Britton and Brown, in the work above cited, make another marked variety worthy of a distinctive name, which they term *arenicola*. This is said to be depressed or prostrate, growing only about six inches high. Sand hills; Cape Cod to Long Island. Several species were made of some of the forms by the earlier botanists,—one named *Solidago hispida*, by the Pennsylvania botanist, Muhlenberg, from its rougher character than usual,—but these are now fully covered by the descriptions of Dr. Gray and others. For all its abundance, it does not appear to have been distinguished by Linnæus. It was first described by Aiton as among the plants of the Kew Gardens, in 1789; though it is said by Aiton to have been introduced into England twenty years previously, namely, in 1769, by Dr. Samuel Martin.

EXPLANATION OF THE PLATE. — 1. Lower portion of flower stem, from a plant of Eastern Pennsylvania. 2. Upper section of flower stem. 3 Outline of the root-leaf system, much reduced. 4. Magnified floret with its akene. 5. Magnified head of flowers.

WILD FLOWERS AND NATURE.

THE GLADNESS OF SPRING.

I feel the spring in every thrilling vein,
As if with nature's vernal mood at once;
Sweet trembling through the drops of April rain,
Shimmers the golden sun,
And far o'er hill of blue and hazy plain
Pours its warm tide again.

The bluebird's tender warble now once more
I hear—his wings have April's azure hue;
The waters crinkle on the sanded shore
And a forefeeling pulses nature through:
The spring is here—the sunless winter o'er.

—HOWARD WORCESTER GILBERT.

THE STUDY OF FERNS. — The beginner in botany rarely pays much attention to ferns, perhaps because of their seeming total separation from flowering plants. In reality there is a gradual modification from one class to the other, though the connection rarely if ever interferes with the amateur botanist, and even many who could hardly be called amateurs.

There is a charm connected with ferns which few persons fail to appreciate, and it is surprising that they are not more generally studied.

Authorities differ somewhat in the classification of flowerless plants, or Cryptogams, as they are known in botany,—some basing their system on the root-character, and others on the shape of what in the botany of flowering plants might be called seed-cases or vessels. The latter is perhaps more generally adopted, though there are still differences in grouping the sub-divisions.

Everyone at all familiar with ferns, knows of the dots usually located on the under side of the fronds. At first green and firm, they finally become brown or emit a brown dust. These dots are called sorus, (sori in the plural) and are groups of cases or sporangia, each of which contains quantities of minute spores — the "dust."

The character of the sporangia is a distinguishing one, as is also their location. In some instances, the sporangia are covered by a membrane, or indusium, which, with its manner of attachment, is also a distinguishing character.

In the *Adiantum*, or Maiden-hair, the sori are scattered on the margins of the leaflets, or pinnules, their indusiums being attached at the sides; in *Pteris*, they are united in one long line directly on the margin of the pinnules; the *Aspidium* has its sori covered by indusiums fastened by their centres; *Polypodium* has scattered sori without indusiums.

Besides the rooting character, the branching and generally formation of the leaves must have attention. Some leaflets have a forking, or dichotomous, character, which in some cases continues on the same leaf for several years,—as for instance the *Nephrolepis;* others, like *Nephrolepis exaltata*, the Sword Fern, have fronds indefinite in their growth. That is to say, the "tip" of the frond is always capable of unrolling further. Some ferns have the power of begetting offspring in a peculiar manner,—though not uncommon in flowering plants also,—namely, by producing bulb-like growth on the margins of the pinnules. These drop off and take root independently or are maintained by the parent plant. *Cistopteris bulbifera* furnishes an example of this character—a viviparous character.

There are ferns to be found in all places, such as the Climbing Fern, *Lygodium palmatum;* the Resurrection Fern, *Polypodium incanum*, an epiphyte inhabiting tree trunks; *Camptosorus rhizophyllus*, the Walking Fern, found on wet rocks; *Woodsia obtusa* on dry rocks; and *Ceratopteris thalictroides* in water. Then there is a dwarf worthy of mention, because of its being difficult to find—*Schizæa pusilla*. Its fronds are but two or three inches in length.

An ordinary pocket magnifying glass will reveal, in most cases, the character of the sori, and their examination cannot but interest everyone.

CHIMAPHILA MACULATA.—Mr. Steele, Festus, Missouri, notes a point overlooked in the description with the plate of *Chimaphila maculata*,—that the flowers are fragrant.

ANTEDILUVIAN CORN FROM NORRISTOWN, PA.—The mildly cautious incredulity with which the Editors of MEEHANS' MONTHLY comment on the extract, in the January number, from the *Philadelphia Record*, announcing the discovery of "antediluvian corn" of the "white flint gourd variety" at Norristown, is probably more than justified by the facts. If the writer is not mistaken, the correspondent of the *Record* who signs himself "T. K." is either identical with or very closely akin to one J. K., of Norristown, who has announced the same discovery at various times since 1893. Quantities of the "white flint gourd variety" of presumably the same "antediluvian corn" were shipped, presumably by the same person, to the Smithsonian Institution that year in the vain effort to convince the paleo-botanists and mineralogists of that institution that the stuff in question, which is nothing in the world but agglomerations of crystals of quartz, was petrified corn of any variety. The result appears only to have been to convince the Norristown botanist (?), who cited the inclusion of the moss in the moss agate in proof of his views, that the scientists of the Smithsonian were unworthy of credit.

It may be interesting to note that the bed rock, from which the quartz crystals probably came, about Norristown, Pa., is one of the most ancient geological formations in the Appalachian province; and its antiquity—far more than twice as great as that of the earliest Angiosperms can possibly have been—is much nearer 35,000,000 years than 4,000 as "T. [J. ?] K." would have us believe. Although it may not be true that "the discovery goes far to prove the existence of man on the Western Hemisphere during the antediluvian period," as your correspondent remarks, the remarkable vitality and persistent stubbornness of the Norristown antediluvian white flint gourd corn fake goes far toward proving the existence of *Equus hemionus* on the Western Hemisphere at the end of the Nineteenth Century. D. W.

Washington, D. C.

SEEDS OF XANTHIUM.—I was very much interested in reading the excellent article on *Xanthium Canadense*, by Newlin Williams, contained in MEEHANS' MONTHLY, 2: 6, 1899. I beg, however, to take exception to the statement that but one of the seeds ever mature.

A careful investigation of the germination of the seed, carried on by the botanical department of the Indiana Experiment Station, for a number of years, resulted in showing that a large percentage of both seeds germinate. [Arthur, Proc. Soc. Prom. Agr. Sc.: 70-79, 1895.] Only one seed, however, was found to germinate the first year, the remaining one germinating the following season.

In a few instances, both seeds germinated the first year, while in other cases, some seeds failed to germinate the second year.

Those connected with the work were soon able to determine by a glance at the bur, which of the two enclosed seeds would germinate the first season. A few words of explanation will also enable those familiar with the fruit of *Xanthium Canadense* to select the seed which will germinate first.

If we examine the fruit carefully, we will observe that it is not elliptical, but that one surface is convex and the other slightly concave. Let the student now hold the bur in a horizontal position, with the convex surface uppermost, and he will find that the pistils of the two seeds will lie in the same vertical plane. If he will now make a vertical section of the bur while held in this position, it will be observed that the two seeds do not occupy the same relative position in the bur, the upper seed being placed higher up in the bur than the lower one.

By numerous germination experiments, both with the seeds enclosed in the burs and removed from them, it was found that the lower seed, or the one nearest the basal end, was the one which germinated the first year. A few instances occurred where both germinated the first season, and again other instances where the upper one germinated first. Usually, however, when the latter case occurred, an examination of the bur showed that the lower seed had either been destroyed by insects, or from some unknown cause had failed to develop.

As to all outward appearance, the two seeds are exactly alike. We must assume that the cause of delay in the germination of one of the seeds must be an inherent one, and thus enables the distribution of the seed through time rather than space.

It is not an uncommon thing to find burs containing three seeds and occasionally one with more.

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WM. STUART, Assistant Botanist,

Exp Sta. Lafayette, Ind.

THE FLORIDA SCRUB-PALM.—In prehistoric times, palms grew pretty well up to the region

SCRUB OR SAW PALMETTO.

of the North Pole, but are now found there only in a fossil state, having been destroyed during the ice age. Now, North America has left but some half-dozen species, and these, with but one exception,—the *Sabal Palmetto*—are confined to our extreme southern borders. The one herewith illustrated is the Florida Scrub-Palm, *Brahea serrulata*, or *Sabal serrulata* of the last generation.

The sharp saw on the edge of the leaf gives it one of its names. This saw will cut flesh or clothing like a knife.

It grows in vast quantities on the ocean side of the Ormond Peninsula. Its main root, from the end of which spreads the group of leaves, is like a prostrate trunk lying just on top of the ground or partly buried or just beneath the surface, and from its under side sends down perpendicularly numerous rope-like roots from a quarter to three-quarters inch in diameter and often ten feet long. Occasionally, a part of the main root rears its head a few feet above the ground, but this only in wet places or where a great many crowd together. The root is rich in tannin, salt and potash; the leaf has a valuable fiber and the flower is one of the best and most generous honey blossoms known. The groups of the leaves are picturesque features in the Florida landscape and yet

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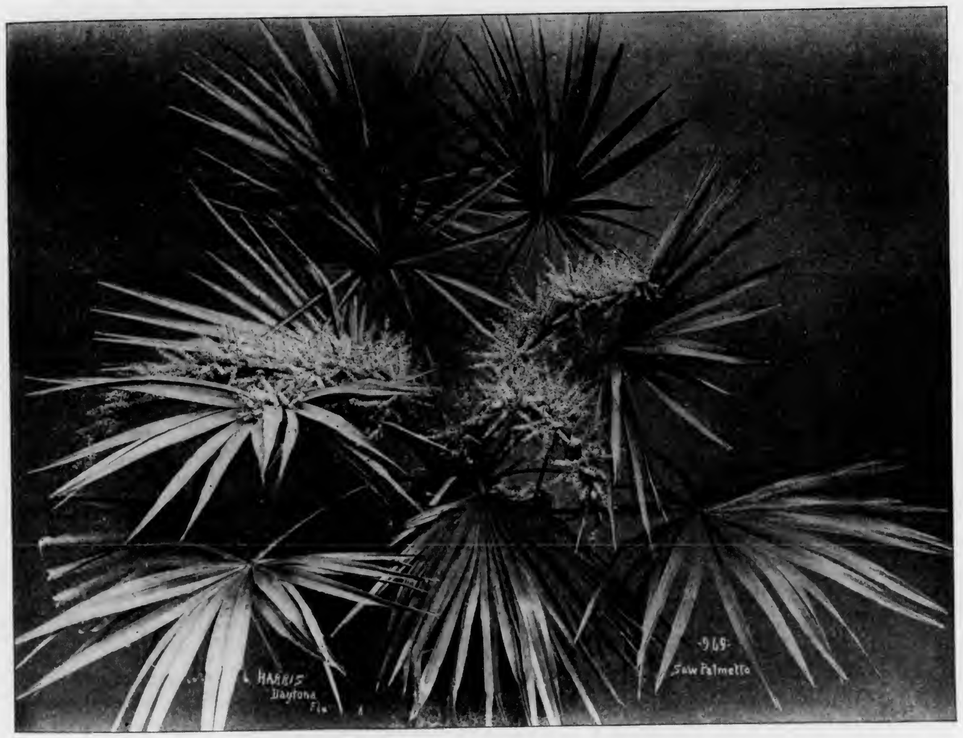

SCRUB OR SAW PALMETTO.

INTENTIONAL SECOND EXPOSURE

the Florida settler, in wrestling with the wilderness when clearing a place to set his orange grove, considers the Scrub Palmetto as the great curse of the country.

The Palmetto berry, produced in great quantities by the Saw Palmetto, is about the size of a small olive, has a large seed or stone like a thin olive and a sweet oily flesh exceedingly nasty to those not hardened to it. Bears are very fond of the berries and fatten upon them. A valuable drug is now being made from this berry, and large quantities are gathered, dried and shipped.

For all this it is a very pretty sight when in flower, as one may judge from the illustration which is made from a photo through the kindness of Anderson & Price, Ormond, Florida.

WITH THE NICARAGUAN EXPEDITION.—A Philadelphian, attached to the Government Surveying Expedition, for the Nicaragua Canal, who is an ardent student of nature, sends the following interesting letter:—

"At last I am in the tropics and on the shores of Lake Nicaragua. One peculiar thing about this part of the country is the fact that it is about one hundred and fifty feet above the level of the sea yet exceedingly swampy. Our work often leads us into water up to our arm pits. Occasionally a hill about four or five hundred feet will rise up in front of us, and as we plod up the steep incline it is not only interesting to watch the gradual change in the plant life from the water kinds to those that grow on *terra firma*, but the various shapes the plants have taken on to suit their environments. The water hyacinth is quite a nuisance around here, and in the construction of the canal some attention will have to be paid to it, for already some of the smaller streams that flow into the lake have been choked up. Something that looks like duck-weed floats around in great abundance. Every now and then we will see some water lilies quite similar to our northern ones. As we get into shallow water, a yellow flower, somewhat like a lupine, but not one, is sure to be found. Soon we get to palms and find ferns growing on them; and a wild morning glory covers everything. As to Acacias, there are any number of them. Soon you get to the high ground and have the big trees that are over a hundred feet high and ten and fifteen feet in diameter. Magnolias and Cedars and Monkey Puzzles and all sorts of tropical trees. Orchids and parasitic plants live here in perfection. One cannot turn his head without seeing some. There are lots of rain and plenty of heat, here, and this forces the plant life extraordinarily. We cannot go outside of the regular lines of traffic without cutting our way. To give an idea of the density of the vegetation, I will give an instance, the like of which occurs again and again. In our party we have sixteen natives, and often they cannot cut a path about three feet wide further than ten or eleven hundred feet per day. In the pastures there is an *Asclepias* that resembles *Curassavica* a good bit. There is also an *Asclepias* with the habit of a vine. The fruit of this is about six inches long and about four wide. The shell to the pod is thick and fleshy and about an inch thick. The bloom I have as yet been unable to find but will send a few seeds. From one pod I took about two ounces of seed. As to fruit, there is any amount of it. Bananas grow everywhere. There are two kinds, the ordinary and a larger and coarser one called plantain. The latter is only eaten boiled or fried. Lemons and limes are so common that the natives do not bother themselves enough to pick and try to sell. Oranges are quite plentiful and are sold in town. For ten cents Nicaraguan money (4 cents ours), you can get as many as you can carry. Yams and Yuccas are eaten instead of potatoes, and they are very good.

A MEDICINAL CACTUS.—There is a cactus related to *Mammillaria*, namely *Echinocactus Williamsi* or *Anhalonium Williamsi* of Lemaire, described in 1845. The American Indians considered the plant as a panacea for all the ills of mankind, a source of inspiration, and the key to the glories of the next world. They believed it to be particularly efficacious in cases of hemorrhage and consumption. They used it also for fevers, headaches, etc. The "mescal" or "mescal-bud" (not to be confounded with the mescal of the Apaches, obtained from the juice of an *Agave*) produces visions, and effects of colors, forms, and pictures similar to the effects produced by opium. It is made into cigarettes, and used with sugar. In fact, it is a special stimulant which acts on the brain.

—*Translated From the French.*

NARTHECIUM AMERICANUM. — Among the many rare plants for which the flora of New Jersey is noted, one of the least common is the American Bog-asphodel, *Narthecium Americanum*. According to the books, indeed, it has been reported from none but that one State, and its known habitat is limited to the southern half of that. Last autumn, while spending a few days in the Pine Barrens, it was my privilege to find the plant in fine fruit, and the sight was one long to be remembered. It grew open to the sun in a broad, shallow depression, the sandy floor of which was carpeted with lycopodiums, and about whose edges the famous little fern, *Schizæ pusilla*, found a congenial home. Close by, on one side, was the dark shade of a cedar swamp; on another, rose a treeless acclivity of sand, gay with a luxuriant growth of *Helenium autumnale*, *Solidago stricta*, and the Narrow-leaved Sunflower, *Helianthus angustifolius*, all in full bloom. Within a stone's throw, the rare *Coreopsis rosea* lifted its pretty head above the still waters of a small pond, upon whose beach the sharp-eyed might detect that curious vegetable imitation of a black pin stuck upright in the mud,—*Utricularia subulata*, variety *cleistogama*. In this select fellowship, the narthecíums were growing by hundreds. From a creeping rootstock bearing a few delicate, short, sword-shaped leaves, the plant sends up a smooth, wiry stem, a foot or more in height and bearing at its summit a dense spike-like raceme of small flowers. At maturity, the flowers are replaced by conspicuous seed vessels, slender pointed and of a bright vermilion color, while the whole stem is suffused with an orange-red glow. The effect of several hundred of these warm-hued plants growing all about among the grasses was singularly beautiful; and lighted up as they were on the afternoon of my visit, by the soft beams of the autumnal sun, they were reminiscent of some spring meadow upon which the Painted-cup has poured its scarlet flood of color.

C. F. SAUNDERS.

Philadelphia.

FROZEN SAP.—Mr. F. K. Steele adds some additional facts to the collection. He notes that rail-splitting is easier in frosty weather; that there is more ice in the sap-wood than in the heart-wood,—that heart-wood burns more easily than sap-wood,—and that in winter when twigs are brittle by frost, ice crystals are more abundant in the sap-wood than in the heart-wood. Splitting of trunks in the winter he regards as wind-shakes, and not from expansion of the water by freezing.

The point in dispute, however, is, whether the living protoplasmic matter in the cells freezes, when these cells are not destroyed in winter.

THE POISON IVY.—I notice in your valuable monthly for February, 1899, an article by Mr. John Hugh Ross, on "Poison Ivy," giving cuts of what purports to be *Rhus Toxicodendron*. You will find, on close inspection, that the cut is *Rhus radicans L.* The *Rhus Toxicodendron* of Linnæus is a shrub of the South, with crenately-lobed, very pubescent leaflets.

Please make this correction in the next number of your MONTHLY, and oblige. We can furnish typical specimens of each, in verification of the above, if desired.

G. H. WHITING.

North Carolina College, Raleigh, N. C.

WHITE CYPRIPEDIUM SPECTABILE.—It appears that my communication to you, relating to *Cypripedium spectabile*, which I found in a pure white form, was without any signature. I think I must have sent you a copy, instead of the original which I intended to send you. I am pleased to know that it is a very rare form, though I hope others of your correspondents will give further information about this and other unusual forms of various species. I may later on send you a few notes myself which may be of interest to you and some others of the fraternity of plant observers.

HENRY A. WARNE.

Henwood, Madison Co , N. Y.

Cypripedium candidum was the subject for a lithograph and text in the "Flowers and Ferns of the United States," Vol. II. Series 2.

THE HICKORIES.—Mr. C. L. Lochman, of Bethlehem, Pa., has prepared photo's of the various species of hickory that are marvels of botanical accuracy. Every part of the plant is shown in one plate. As the different species over-lap each other in their several line of variations at times, illustrations such as these are of inestimable value.

GENERAL GARDENING.

DEPARTURE OF THE DAFFODIL.

Fair Daffodils, we weep to see
You haste away so soon.
As yet the rising sun
Has not attained his noon.
Stay, stay,
Until the hasting day has run
But to the evensong.
—HERRICK.

COVERING WOUNDS IN TREES.—Mr. Peter Van Vechten, Milwaukee, Wis., agrees with MEEHANS' MONTHLY, that the wounds, made in the stems of trees by pruning or otherwise, should have the wood preserved to keep it from decay till the new bark and wood extends over it, but he thinks gum shellac dissolved in alcohol far better than paint. He advises to put the shellac into a wide-mouthed bottle, cover it with alcohol, and let it stand twenty-four hours, when it may be applied with a swab or brush. It serves, as nearly as may be, as the substance of bark; is not affected by heat or cold or wet or dry weather; and retains the sap up to the cut, healing the wound without a scar. Any limbs cut off square on top will leave a dead end from six inches to a foot, which will eventually die and rot off. Limbs should be cut off slanting—never square on top—as is often done.

BURYING THE TRUNKS OF TREES.—B. A., Toronto, says:—"I trust you will not think me over-critical with so many queries, but desire to be regarded as an honest learner. In the notice of Milton's mulberry tree, you say to help it a mound of earth has been erected around the trunk. I have always understood that, in filling in around large trees, care has to be exercised to keep the earth from the trunk. How, then, is Milton's mulberry tree aided by that which kills other trees?"

No intelligent gardener teaches that earth around the trunk of the tree will injure the tree. The leaving of a cavity around the trunk when earth is filled in under the branches of a tree, is for a very different reason. The feeding roots are always near the surface, and the gases of the atmosphere, are necessary to prepare the food. Covering these roots deeply deprives them of this air. They are smothered. The cavity around the tree is to aid in supplying air. The rains go down this cavity easily, and air follows where water goes. Every good gardener knows that earth around a trunk is a benefit, so long as the roots under the spread of branches are not covered up.

STREET TREES AND PATENT PAVEMENTS.—It is to be expected that everyone in planting trees will exercise the usual care to see that drainage conditions are satisfactory; but when the street pavement and sidewalk are asphaltum or other patent material, unusual care is necessary to have not only good underdrainage but also good conditions above for the encouragement of moisture.

A hole one foot in diameter is insufficient if cut directly through the pavement, as both air and water must pass through for the support of the tree. Two feet width is better, and six inches more will be acceptable; and if the surface be depressed towards the tree, to attract rain water, so much the better. Add a top-mulch of hay or strawy manure, and the conditions will be improved. A layer of well-rotted manure placed just above but not next to the roots will hold moisture, at the same time giving food to the roots. Brick pavements are not as objectionable to trees, as there are many openings to admit the elements needed.

QUASSIA.—The trees which furnish so many economical products from the more tropical regions are, in many cases, getting scarce, and those who deal in drugs are continually kept on the watch for other species of trees having similar properties to replace the original ones. There is the Quassia, which is a small tree growing in British Guiana, botanically known as *Quassia amara*, and is getting nearly exterminated; and another tree, known as the Bitter Ash,—botanically as *Picræna excelsa*,—is largely used for the same purpose that Quassia chips are used. An infusion or tea made of Quassia chips is especially destructive to the green fly and other insects, which are so troublesome to the ladies who grow their own flowers in conservatories. The usual remedies applied by commercial men in the shape of kerosene emulsion, tobacco smoke, tobacco water, and other things, are more or less offensive, while Quassia tea has no objectionable features whatever, and is just as effective. It is a remarkable fact that an infusion of Quassia should be so destructive to the lower orders of animal life, and yet be so harmless to the human system. One may drink it as we drink Chinese tea without any serious consequence.

SCENE IN MIDDLESEX FALLS RESERVATION, MASS.

NATURE IN LANDSCAPE GARDENING.—We are taught that art is but nature better understood; but the denizens of large cities rarely see wild scenery. They have little chance to compare art with nature. Philadelphia has managed to retain a considerable portion of natural scenery in her Fairmount Park, and within the boundaries of large tracts near other large cities, advantage has been taken to secure plots and retain them just as nature made. Annexed is a representation from a photo, kindly furnished by Mr. Warren H. Manning, of a scene in the Middlesex Falls Reservation. It comprises chiefly Red Cedar, Paper Birch, and alder. It is to be hoped that it will be a long time before the "landscaper's" art starts in to make this gem of nature "better understood."

RAILROAD STATION GARDENS.—In MEEHANS' MONTHLY for February, mention is made of the care and decoration of the grounds about railroad stations. On many of the western roads, this is being done—perhaps more than on eastern. Among the most noted that come to mind, is the Michigan Central. A year ago last summer, we were on one of the through trains for New York. It was hot and dusty, and the car full of people out from Chicago. We passed numerous small stations with well-kept grounds; but when the train slowed up for Niles, Mich., what an exclamation of delight and surprise came from the passengers as they saw the green, velvety lawn, with beds and clumps of beautiful flowers on every hand!

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INTENTIONAL SECOND EXPOSURE

Every head was at the window, if possible. Soon another surprise: just before the train started, a young boy, with a large market-basket, passed through the train giving all the passengers a bit of the floral beauty to take with them,—little bouquets containing a bit of green and two or three flowers. Mine was sweet peas, an aster and geranium leaf. Those hot, tired, dusty people forgot for the time how uncomfortable they were. It gave them some new ideas, and the Michigan Central lost nothing by this little act of courtesy.

MRS. FREDERICK C. JOHNSON.

Conklin. N. Y.

MISTAKES IN LANDSCAPE WORK.—To the student in landscape effects, mistakes appeal almost as forcibly as do meritorious features. Every landscape gardener has ideas about certain effects, some of which are peculiarly his own, yet the main idea of harmony prevails—or should prevail.

The endeavor of this article is to point out a few mistakes, that have come under the observation of the writer, in hopes the experience may be of some use to those who have landscape work in contemplation. Generalizations sometimes work harm if not treated right, and particularly in a study of this kind must the artist keep in mind that rules are made for guidance merely and must occasionally be modified to fit certain conditions.

First of all, the preservation of natural advantages should be studied. A large expanse of lawn, for instance, is not always held in sufficient appreciation. Instead of arranging the planting to permit of long, open views from the chief points, groups are placed almost promiscuously, until the residence is shut off to observation for perhaps a few hundred yards. Other work shows the extreme—a great expanse of lawn closely bordered with an irregular mass of shrubbery, as it were a picture-frame, and a very few specimen trees here and there near the belt to break some of the monotony. This planting is in some cases effective, but generally as a whole, the lawn lacks the beauty of individuality. In planting a large lawn, several objects must be continually in sight, *i. e.*:—provide for a sufficient stretch of lawn to show its real size; protect views not only of certain surrounding territory, but of any choice object on the same place, such as fine, old specimens of trees, or a strip of woodlands which will afford pleasant autumn colorings;—avoid crowding the residence; don't make the outlines unnecessarily formal.

Another phase of arrangement is proper distances considering the future development and effect. Some of the most able landscape gardeners advocate planting for immediate effect, trusting to "thinning out" or transplanting when necessary, But is this not a case where it will be best to consider what will likely be done rather than what can be done? How frequently are old places met with, the specimens, that should command admiration, running ruinously into each other, the dense shade and dryness from crowded roots killing out turf and generally showing a kind of age that is not appreciable? And the owners are not strictly to blame, for even old trees become familiar friends, and cannot be cut out without a great deal of nerve. With an extensive knowledge of trees in general, with particulars of their growth, such as every efficient landscape gardener should have, it would not be difficult to make a pretty acceptable effect for the time being, sacrificing, perhaps, a few years of early perfection for many years of the future.

Evidences of hasty selection are remarkably plentiful, and especially in the matter of selections as respects form and color. The writer has seen beds of colored-leaved shrubs all leaning to one color without the needed green for contrast; beautiful beds of grasses spoiled for the simple reason that the light-green arundo donax, comprising the centre, was not sufficiently strong in contrast with the variegated Eulalia which made up the rest of the bed.

Recently, while standing on a prominence overlooking several private grounds,—large estates,—a grievous error was disclosed. A beautiful lawn was completely dotted in almost a regular and incomprehensible manner. It hardly seemed possible that any study could have been here, but rather, it had been in the hands of one lacking an eye for the artistic as well as utility. Such work never pays under any consideration.

Where an estate is graced by a piece of natural woods, it quite frequently attracts the owner as an untidy, overgrown spot, and orders are issued to clear away all small growth and sow grass seed. The invaluable native dogwood is liable to go under such instructions, and an unnatural, ineffective piece of land is the result. In marked contrast with such a condition is a piece of woods on the property of Mr. John Pitcairn, Bethayres, Pa. Suggestions of paths wind through it, revealing an abundance of interesting material in the shape of ferns, wild flowers and shrubbery.

CHOICE SPECIES OF PINE.—The selection of pines will always vary, according to the needs of the purchaser. Some want rapid-growing kinds, others dwarf and compact; some will prefer certain shades of color, and others select according to the character of the leaves (or needles). One of the greatest favorites is the Austrian Pine, perhaps on account of its boldness of growth, long needles and whitish-grey buds which contrast well with the dark green foliage. Very similar to this is *Pinus Thunbergii*, in fact, one would frequently pass for the other if not side by side. Among the species hardy in the North, none excel *P. densiflora* in rapidity of growth. Its needles lie rather close to the stems, and are very bright green. The names *densiflora* and *Thunbergii* are frequently exchanged, though the two species are very distinct.

For rapidity of growth, the White Pine also ranks high in popularity, besides which it is very hardy, and stands transplanting well. Its needles are soft and light in color. In strict point of beauty, the Bhotan or Himalayan Pine is surpassing fine. Its color is silvery gray, which the long, abundant needles well display, It is a graceful species, of medium-rapid growth; does not grow too tall, but is rather compact. Too much cannot be said in its favor respecting its beauty as a specimen for the lawn.

The Scotch Pine is a great favorite. Its needles are short, slightly greyish in color, and the habit of growth rather compact. It and the White Pine are frequently to be had in dwarf, compact form. *P. Mugho* is by nature a dwarf, rarely at great age reaching six feet in height, and forming a compact broad mass. In direct opposition to the latter, the Swiss or Stone Pine—*Pinus Cembra*—ascends very erect like a Deciduous Cypress. It has soft needles, like the White Pine, and is sufficiently valuable to demand greater attention than it gets at present.

Pinus flexilis and *P. edulis* are native species rare in cultivation, though choice and interesting. The latter is famed for its edible seeds, which are cooked or eaten raw by the Indians.

For ornamental purposes, *P. contorta* is one of the best. Its foliage is of a dark green color, and strangely twisted, giving it a distinctive character quite desirable. This should be more generally planted.

South of Philadelphia, the beautiful long-leaved pines,—as *P. Tæda*, or Loblolly Pine, and *P. palustris*, distinguished by the name of Long-leaved Pine,—are perfectly hardy, and would doubtless make attractive lawn specimens while small and if well clothed with foliage. The branches of *palustris* are well-known to Northerners in decorations about Christmas time.

The question is frequently put: "Which do you recommend as most desirable?" and the best answer is "All of them"—referring to those enumerated in the preceding paragraph.

NEW OR RARE PLANTS.

PLUMBAGO ROSEA.—I would like to say a few words in praise of a nice little winter bloomer that might interest your readers. When the *Plumbago rosea* was announced, a good many persons, thinking it was only a variety of the *P. capensis*, gave it the same treatment and were disappointed; some jumping too hastily at the conclusion it was a humbug. I have raised it for three or four years and I am well pleased with it. It is strictly a winter-bloomer; consequently, by putting it in some warm room in winter, it keeps in bloom all the cold season. Ours, up to to-day, has been blooming for nearly two months, and is covered yet with its beautiful racemes of red flowers. I really can't praise it too much. J. REVERCHON.

Dallas, Texas.

As Mr. R., says, this beautiful plant has been singularly overlooked.

NEW CANDYTUFT, LITTLE PRINCE.—I saw growing in Erfurt (Germany), last summer the new dwarf candytuft Little Prince, and I consider it one of the most desirable introductions that will be made this year.

It is from the beautiful variety, Empress, that this new one was obtained, though only half the height of the parent, say 4 to 6 inches,

forming just as massive spikes of large, pure white flowers, which, standing erect, are grouped candelabra-wise around the main stem. Of extremely robust constitution, it continues longer in full bloom than the Empress. When planted in masses it produces a splendid snow-like effect. HENRY F. MICHELL.

Philadelphia.

THE JAPANESE QUINCE.—There is an old story of the grumbler who thought everything was made wrong, that, in one of his examples

SILENE COLORATA.—Flowers Rose Color.

he thought it would have been wiser to have ordained a big strong tree like an oak to bear large pumpkins, than little acorns of no material weight at all,—but when an acorn fell on his head from a height of 30 or 40 feet, he was ready to thank Providence that pumpkins grew on the ground. And yet nature does seem to delight in opposite experiences. Here before us is a specimen of a Chinese Quince that weighs 18 ounces. The tree bearing them is about 25 feet high, and has been for many years in an old Germantown garden, where are so many rare trees introduced by lovers of good things in the last generation. It is a beauty in the fall of the year, the leaves rivaling the pepperidge in crimson brown of their tint. The Chinese Quince is *Cydonia Sinensis*. It must not be confounded with the Japanese Quince, which is *Cydonia Japonica*.

THE HARDY FLOWER GARDEN.

SILENE COLORATA.—The genus of plants, comprising what are popularly known as catchflies, has a number of very ornamental species,—and not by any means the least among these pretty members of the family is the one now illustrated. It is among the brightest colored of the lot; the deep, rosy flowers being continuous from early spring till fall. Besides its beauty as a border plant, its somewhat trailing habit makes it very useful in rock-work, vases, hanging baskets or any place where a pendulous character is desirable. It is a native of Southern Europe. From its deeply divided petals it has been known as *Silene bipartta*, *Silene bifida*, and perhaps by some other names,—all now referred to *S. colorata*.

SHIRLEY POPPIES.—Few things have burst on the floricultural world in more pleasant surprise than the Shirley Poppies. Is it possible anything can be more beautiful? The improvement has been the work of an English clergyman, the Rev. W. Wilks. The petals fall early,—the chief and well-known weakness of the poppy. To have them last as long as possible, a correspondent of the *London Gardeners' Chronicle* says :—Cut them early in the morning, as soon as they open, and at once plunge their stems in a jug of water, and carry them inside the house for the decoration of the rooms, and arrange them in vases with delicate ferns or other light foliage. Nothing yet invented in the way of flower-tints and forms can equal their fascinating beauty. They should preferably be placed in a cool room."

FRUITS AND VEGETABLES.

PARSNIP CULTURE.—Many think parsnips cannot be sown too soon, and go to much trouble to secure exhibition roots. The ground

for parsnips is best if of a loamy nature, but in soils where these root-canker at the crown I would certainly defer sowing till early in April, as then growth is quicker, and I think the roots are of better flavour. I am aware roots sown in April lack the size of those sown earlier; but for home use I fail to see their value. In no case should these roots be given freshly-manured land, as in such the roots fork badly and lack quality. Avoid crowding; a space of 18 inches between the rows is none too much. Probably the best medium-sized parsnip is The Student, though the new Tender and True, given a trial last year, is a gain in the right direction. It is smaller, but of perfect shape and superior in quality to the older kinds.—*Gardening Illustrated.*

PECAN CULTURE.—Pecan nut culture is found profitable in some localities. The Swinden Pecan Orchard Company has 780 acres in an orchard. It is at Brownwood, situated 120 miles Southwest of Fort Worth, Texas. Some wild trees are from 40 to 60 feet high, and from two to three feet in diameter. The cultivated trees commence to bear at from seven to ten years' old. A fifteen year old tree will bear from 8 to 10 bushels. Old trees have been known to produce 40 bushels. The timber is valuable as well as the nuts. The 780 acres were bought for $125,000. Only 400 acres, however, are as yet planted with the trees.

That the readers of MEEHANS' MONTHLY may see the vast difference between the wild pecan and cultivated varieties, illustrations are presented with this through the kindness of The Swinden Pecan Co.

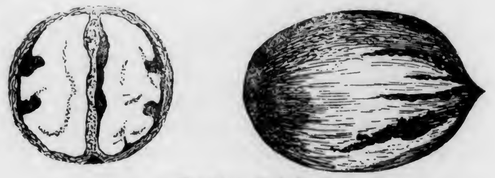

Figure 1 Swinden.

Figure 2. Stuart.

Figure 3. Van Deman.

Figure 4. Common Wild Pecan.

FORCED FRUITS AND VEGETABLES.—Referring recently to the vast difference in the quality of a pine-apple, when grown under the supervision of an intelligent gardener, and the ordinary market fruit, reminds us to say that the same is true of many other fruits and vegetables,—and this is one of the strongest arguments for amateur gardening as distinct from the business of growing for market. The one who has a small patch and cultivates it himself has treasures no market can supply, wholly aside from the pleasure the occupation gives him; while the one who has a larger tract, and can afford to employ a skilful gardener to oversee things, adds largely to his sum of human pleasures.

Just now these facts impress one strongly by a basket of tomatoes, received this first of February, from Mr. Lawler, gardener to A. C. Harrison, of Chestnut Hill, Philadelphia. There is about as much difference between these and the ordinary market fruit, as there might be between a peach and a pumpkin.

SPRAYING FRUIT TREES.—The spraying of fruit trees in order to destroy injurious parasitic fungus and destructive insects has now almost become as regular a part of gardening work as weeding and in other ways cultivating the garden crop; but it requires just as much judgment as any other department of gardening. Sometimes injury results from the strength of the copper solution. It is well, therefore, to use a small portion of lime, which is believed to be a security against the excess of the other articles. And again, spraying is often a failure through the application not being thorough.

The under surface will sometimes be missed, or the spraying machine put in a position where the upper surface of the leaves receives little of the spraying mixture. It is not wise to spray when there is a probability of rain soon following, as in that case the mixture is washed off, and, if by chance rain does follow, another application should be made. Many of these suggestions come to persons of good judgment, but unfortunately these are not in the majority of those who have to do garden work.

IMPROVED CHESTNUTS.—The persevering efforts of the Parrys, Parry P. O., N. J; towards the improvement of nuts, and chestnuts in particular, call for considerable praise, as, to these efforts is doubtless due the popularity of nut culture which is constantly increasing. They have in hand the Japanese, Spanish and American species, from which many varieties have already been obtained. They are a recognized authority on nuts, and have issued a pamphlet on the subject, "Nuts for Profit."

FIRES TO PROTECT ORCHARDS.—On page 8 of your January number, with some observations of Wm. Saunders upon the ascent of warm air, for a text, you seem inclined to question the idea of protecting orchards from light frosts by smoke, and express the opinion that spraying with water would be more philosophical. I think that item must have been written on the spur of the moment, and that you will hardly endorse it yourselves. I believe it is a well established fact that even quite tender plants will go through a pretty severe frost unscathed, if the rays of the sun are intercepted in the early morning by clouds, until the temperature rises sufficiently to thaw out all the frost, and a dense cloud of smoke will produce the same result. I believe it is an equally well established fact that when our first autumn frosts follow a severe drouth, it requires a temperature about 5° lower to produce a killing frost than in a wet season, because of the greater evaporation of moisture and the consequent increased abstraction of heat; and why will not spraying with water (unless in large quantity and continuous through the night) produce a similar effect? I really cannot see what the principle of the ascent of warm air has to do with either case.

Hammonton, N. J. WM. F. BASSETT.

Mr. Bassett's position is correct as regards a cloud of smoke. If a cloud of smoke could be retained over an orchard, until the temperature advanced beyond the freezing point, it should be beneficial. But dealing with the question of a fire, aside from the smoke question, the points are that warm air could not rise until cooler and heavier air forced it upwards. In other words, rarifying the air lets the cool air in.

MERSEREAU BLACKBERRY.—The Mersereau is said to be a sport from the Snyder. Prof. Bailey says of it:

"A variety resembling Snyder and derived from it. Some four years ago the originator noticed an extra large, strong bush among his Snyders and began to propagate from it. He is now gradually changing his whole plantation over to this new variety; it is one of the most promising varieties I know."

THE AMERICAN POMOLOGICAL SOCIETY.—The meeting of the famous American Pomological Society is to be held in Philadelphia this year, on September 7th and 8th. It promises to be one of the most popular in the history of the society. Circulars with programme and particulars may be had of the Secretary, W. A. Taylor, 55 Q Street, N. E., Washington, D. C.

NEW PLUM, MARY.—While the comparatively new Japanese plums have become deservedly popular, many persons still feel attached to the flavor of the European class, and like to have a few trees in their orchard.

The Mary is a new yellow variety strongly recommended by Storrs & Harrison Co., Painesville, Ohio. It is of the delicious Gage class.

NEW CABBAGE. — Van Namen's Excelsior Dutch Cabbage is one of the new candidates for public favor. Its chief merits are said to consist in its lateness, and the round, solid snow-white heads. Like the old saying, "The proof of the pudding is in the eating," the best recommendation of any novelty is in the result of a fair test.

BIOGRAPHY AND LITERATURE.

SPRING'S GREETING.

The zephyrs after lengthy frost, how mild!
Lo, violets fresh bring me a begging child.
'Tis sad, that thus Spring's greetings first should be
Presented me by hand of poverty,
And yet, the pledge of happy days the more
I prize, since offered by affliction sore.
Thus to posterity our ills do bring,
Foreboding better times, the hope of Spring.

LENAU.

(Translated from the German by Henry D. Wireman.)

REV. J. HERMANN WIBBE.—The ablest botanists are not always among those the best known. Of these humble but able devotees of the amiable science, was the Rev. J. H. Wibbe, rector of the Roman Catholic Church at Schenectady, New York. His love for plants had a wide influence on all around him. The *Globe* of Utica says of him:—

"Father Wibbe maintained a conservatory which cost him many thousands of dollars and which contained the finest collection of palms, orchids, banana plants and other rare and tropical species in this vicinity. He had made this phase of nature a life study and was regarded as one of the leading botanists in this country. At one time he was assistant botanist at the Smithsonian Institute and the United States Department of Agriculture at Washington, and in 1877, President Hayes appointed him to classify the flora of the far west."

He was born at Munster, in Germany, September 25, 1848, and came to America in 1870. He died on the 7th of January.

ANEMONE.—The value of good poetry, as a guide to correct pronunciation, is well illustrated in the quotation from Percival in the March issue of MEEHANS' MONTHLY. It will be noted that the poet pronounces the name of the flower An-e-mo-ny, instead of A-nem-o-ny, as is the general practice. Percival is right from the classical standpoint; but it is custom that gives law to language, and the latter is the pronunciation in general use.

FOX-GLOVE.—B. A., Toronto, says:—"The history of plant names has an interest for all persons of intelligence. Would it be asking for too much space that the conductors give their own version as to the derivation of Fox-glove? From what word could 'fox' possibly be corrupted, as suggested in the recent chapter on this plant?"

It is not safe to appear *plus sapit quam Thales*, as the old Romans might say. It is, however, admitted that the word, glove, is a corruption of an old continental word signifying bells. Another continental word is *faux*, which signifies false. False, or imitation, bells, would have a fair meaning in connection with these flowers. The objection might be that the modern French people pronounce *faux*, fō,—but old-time English people, when they adopted foreign words, often put their own style of pronunciation to them, as in *Paris*, and other instances. That they should come to pronounce *faux*, fox, is not more improbable than many other far-fetched explanations of the name fox-glove. Fox-glove may stand for false bells, as for something else.

CITY PARKS AND OPEN SPACES.—The Second Report of the American Park and Out-door Art Association should be read by every one interested in this great element in the progress of public parks as aids to civilization. The work undertaken by this Association is wholly for the public good. It is rare to find any body of men and women banded together for a less selfish purpose. It is pleasant to note by this report that the society is meeting with encouragement. One of the difficulties the society finds in the way is the utter ignorance of gardening matters that everywhere prevails. One speaker, at the annual meeting of the society, reported that they prepared labels for the park trees, but could find no one who knew the trees—and another reported that he asked a number of citizens supposed to be intelligent, the name of a remarkably beautiful tree near their homes. But though thousands passed the tree daily, he could not find one who knew

any name for it, though it was the common Ailantus. Copies of the report may be had by enclosing a stamp for postage to Warren H. Manning, Secretary, 1146 Tremont Building, Boston,, Mass.

ALFRED BRIDGEMAN.—Usually, honors are sought,—and, too frequently, the parties themselves write their own laudations. Hence there is seldom need of corrections. In our voluntary tribute to the honorable career of the Bridgemans, a correction is necessary. Mr. Geo. Lorenz is not the manager of the City Seed-house, but of the greenhouses in Astoria. The proprietor and manager of the "Alfred Bridgeman Seed-house," now, is Mr. Edward A. Peth.

FLORA OF PENNSYLVANIA. — Mr. Joseph Crawford, Chairman of the Committee on Botany of the Philadelphia College of Pharmacy, has prepared a catalogue of the Flora of Pennsylvania. He enumerates over 2000 species. The pamphlet is entitled "Pennsylvania Pteridophyta and Spermatophyta," which, being interpreted, means the flowering plants and ferns, though the allies of ferns are included in the lists.

PLANTS OF THE CAPE OF GOOD HOPE.—In noting the death of Mr. John Lee, of the Hammersmith Nursery, near London, on the 20th of January, in his ninety-fourth year, the London *Gardeners' Chronicle* states that he and the Empress Josephine of France, in partnership, sent Francis Masson to the Cape of Good Hope, to introduce the beautiful flowers of that region to European gardens. In this connection it may be of interest to note that a large portion of Masson's Herbarium is preserved in the collections of the Academy of Natural Sciences of Philadelphia.

NATURE TEACHING IN THE PUBLIC SCHOOLS.—The modern idea that education is best served by teaching the young to see, compare, and judge for themselves, is producing remarkably good fruits. Nature studies are now an essential part of a school curriculum. Publishers are not slow to see the trend of the stream, and books of this class are numerous. An able contribution is by the Prang-Taber Art Co., of Boston. They are issuing in serial form, "Wayside Flowers," by L. Schuyler Mathews. The illustrations are in pen and ink studies, and the descriptions so brief and pointed as to be intelligible to a child. "Botany made easy" might be an additional title to these "Wayside Flowers."

GEOGRAPHY OF THE PASSION FLOWER.—A correspondent kindly calls attention to a paragraph in the chapter on the Passion Flower, which states that all the many species of Passion flowers are natives of the American Continent; while another paragraph in the same chapter says: "with possibly some half dozen exceptions the Passion flowers are natives of the New World."

The exact facts are that one species has been found in China, one in the Himalayan Mountains of the East Indies, and thirteen in Australia and the Islands of the Pacific Ocean.

GENERAL NOTES.

NEW PARK AT HARTFORD.—The reproach of America, that it has not profited by the Old World civilization, as to the actual necessity of parks and breathing places for its growing cities, is being rapidly and happily wiped out in various directions. Newspapers continually bring word of the openings of new parks in various directions. One of the most recent is Riverside Park, Hartford, Connecticut. This is 68 acres in area, and cost for its improvement about $750 an acre. It is situated in the most densely populated part of the city, where such a park should be, and combines playground ideas with park beauties. It appears to be one of a chain of connected parks that this enlightened city proposes to form.

The Park Commission of Hartford appear to be an enlightened body of men. Mr. Patrick Garvin, the President of the Board, and our good correspondent, Dr. Gordon Russell, one of the oldest members of the Board, made happy addresses at the opening.

HYBRIDITY.—The Royal Horticultural Society of London has arranged for a congress to meet in the first week in July, in which the subject of hybridity alone is to be discussed. Professors Bailey and Meehan, from this side of the Atlantic, have been invited to be present and give addresses.

CALLUNA VULGARIS.

COLOR PLATE

CALLUNA VULGARIS.

HEATHER.

NATURAL ORDER, ERICACEÆ.

CALLUNA VULGARIS, Salisbury.—A foot or less high, in broad tufts, more or less whitish-tomentose or glabrate: branches four-sided by the imbricated leaves: these minute, three-sided, grooved on the back; flowers appearing in summer, crowded on the branchlets, as if spicate or racemose, commonly secund, rose-colored or sometimes white. Gray's *Synoptical Flora of North America*,—also *Manual of Botany of the Northern United States*, by the same author; and Britton and Brown's *Illustrated Flora of the Northern United States*.

It was the scope of this undertaking to illustrate only the native flowers and ferns of the United States, in its strictest sense. Those introduced from other countries since the advent of the white man were to be excluded. The beautiful and famous plant now illustrated was not known in our country till the middle of the nineteenth century. There is no evidence satisfactory to the author that it is truly an indigenous plant, and not a waif from the Old World. But as it has been admitted as a truly native plant by Dr. Asa Gray and other eminent botanists, and will for all time probably appear as such in their works, there is no alternative but to admit it to a place in our collection.

One need scarcely say that *Calluna vulgaris* is the famous "Heather" of the Old World,—a plant which, under this name, has entered into English literature to an extent which even the rose or the violet could scarcely lay claim. In the early part of the nineteenth century, it was known as *Erica vulgaris*. *Erico* was the name applied by Pliny to the heath,—the one now known as *Erica Mediterraneana* being probably the one with which he was acquainted. Travellers speak of its striking beauty in the natural scenery of the Mediterranean region. It is the species our poet Percival refers to when describing Greece from Mount Helicon.

"——— now the mountain,
Lifted above the forest region, glows
With flowering shrubs, that scatter odorous airs,
Sweet as from Eden,—purple heath and balm,
And lushing beds of thyme, and bright laburnum."

Pliny says that from this *erico* the bees made a very fine kind of honey which went under the name of *Mel ericæum*. But Salisbury, an eminent English botanist, called attention to some peculiar characters, distinguishing it from all other Ericas. He proposed for it a distinct position in classification,—and *Erica vulgaris* of Linnaeus thus became *Calluna vulgaris* of Salisbury. The distinction is certainly very striking, and yet it is remarkable that of the many hundreds of species of *Erica* known in the Old World, the South of Africa, especially, only this one should present these special characters. This is connected with the calyx. Ericaceous flowers are monopetalous, but one would think that the flowers of *Calluna* were divided into four petals. To illustrate this point, the enlarged flower, Fig. 3, may be examined. But in truth, what appears to be four pink petals are four sepals or divisions of the calyx, which have been unusually enlarged, so as to enclose the monopetalous corolla, and has assumed the rosy pink tinge the corolla ought to have had. To replace the ordinary calyx, four normal leaves have become enlarged and serve as calyx-like bracts to the real calyx. The common name, heather, however, clings to it yet. It was proposed when *Calluna* was separated from *Erica* proper, that it should be known as Ling, while Heather should be retained for the other three species of the old genus, which is found to a limited extent in various English localities. But this has not been generally adopted. When heather is referred to in English literature, the plant here illustrated is understood. The well known lines of Sir Walter Scott in "Lady of the Lake," describing the Stag hunt, may be given in illustration.

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COLOR PLATE
INTENTIONAL SECOND EXPOSURE

"As chief, who hears his warder call,
'To arms! the foemen storm the wall,'
The antler'd monarch of the waste
Sprung from his heathery couch in haste.
* * * * *
Then as the headmost foes appeared
With one brave bound the copse he cleared,
And, stretching forward free and far
Sought the wild heaths of Uam-var."

In prose as in poetry this species is the heather. Dickens says, in "David Copperfield," "And now the unseen heather lies in mounds and bunches underneath a covering of snow." English literature would weaken its inspiration if, for Heather, Ling were to be substituted. In the ancient English language, a broad waste piece of land was known as a Heath, and the common name, heather, is supposed to be derived from this. Hundreds of acres of sandy or gravelly ground would be completely covered by it.

The idea of our plant being a true native of America would have been deemed ridiculous. When the poet Percival first referred to it as a native of Vermont, in his "Ode to a dried up Lake," his inclusion of the heath among the flowers which suffered was criticised by botanists, and considered allowable only under the "poet's license," though still with the reservation that Shakespeare would not have blundered so.

"There the dark fern flings on the night-wind's wings
Its leaves like the dancing feather,
And the whip-poor-will's note seemed gently to float
From the deep purple-brown of the heather."

But about the middle of the century a few plants were found in a bog about 20 miles from Boston. Other plants have since been found in other places, but no one found any plants that appeared to be over twelve years' old when discovered. But the desire, to feel that America as well as the land of Burns had a vested right to the famous plant, was very strong, and there sprung up an unusual interest in the subject. Whittier's pretty lines were felt to be real—both in body as well as spirit.—

"No more these simple flowers belong
To Scottish name and lover,—
Sown in the common soil of song
They bloom the wide world over.

In smiles and tears, in sun and showers
The minstrel and the heather,
The deathless singer, and the flowers
He sang of life forever.
Wild heather-bells and Robert Burns!
The moorland flower and peasant!
How, at their mention memory turns
Her pages old and pleasant."

Since these discoveries the plant has spread so much that it threatens to destroy some cranberry plantations. It would have done this ages ago, if it had been a true native. The locality given in the meeting of the Torrey Botanical Club of September 10, 1878, near Egg Harbor City, New Jersey, was visited by the author, and the plants were proved to have been introduced.

An interesting point in the history of many plants is the peculiar geological tastes that so many of them indicate. In the present instance there seems to be a special love for soil that contains a more than usual store of oxide of iron. The barren heaths of the Old World are said to owe this reputation to the large proportion of this mineral that it contains. But this just suits the heath,—and thus we find it abounding in those localities where this condition prevails. Those who desire to cultivate the plant will do well to remember this fact. It has been stated by some of those who argued in the first instance, that the plant was not a genuine native of our country, that they had failed to get it to grow, and it was hastily concluded that the heather would not grow in America. The fact was that the plant's requirement had been overlooked. Planted in soil uncongenial to its growth, it exhibited its dislike of that treatment. On the grounds of the author, where it has decomposed gneiss abounding in per-oxide of iron, it thrives in great luxuriance.

Another useful lesson is, however, conveyed by a study of the heather. Plants will, at times, make sacrifices of some conditions favorable to growth, when others desirable are presented. In this case we find a plant that seems especially adapted to dry, barren wastes in England, favored by a mineral element they enjoy, thriving with equal luxuriance in New England cranberry bogs. In this case the feeding rootlets are not in the water, but in the moss on the surface. The air in the moss, is the mineral equivalent.

EXPLANATION OF THE PLATE.—1. A flowering branch painted from specimen sent by Mr. Jackson Dawson, in August. 2 Branchlet with ripening fruits. 3. Enlarged flower showing the enlarged calyx lobes. 4. Anther enlarged.

WILD FLOWERS AND NATURE.

HIAWATHA ON THE PRAIRIE.

All the air was full of freshness,
All the earth was bright and joyous,
All before him, through the sunshine,
Westward toward the neighboring forest
Passed in golden swarms the Ahmo,
Passed the bees, the honey-makers.
Burning, singing in the sunshine.

Toward the sun his hands were lifted,
Both the palms spread out against it,
And between the parted fingers
Fell the sunshine on his features,
Flecked with light his naked shoulders,
As it falls and flecks an oak tree
Through the rifted leaves and branches.

—LONGFELLOW.

A LITTLE VOYAGE DOWN FORKED RIVER.—Forked River, in New Jersey, is one of numerous tributaries of Barnegat Bay, and is so-called, I believe, because the confluence of several streams from the Pine Barrens into one, a short distance from the Bay, suggests a fork with its prongs. A mile or so back from the Bay, and situated on one of these "prongs," is the village of Forked River, known from time immemorial to lovers of rod and gun as one of the best sporting resorts on the coast. To the botanist, it presents unusual advantages for the study of the rich flora of southern New Jersey. Pine barrens, cedar swamps and peat bogs; fresh water ponds and meadows, and flowing streams; salt marshes and seabeach sands—such are the varied hunting grounds accessible in a few minutes' walk from any of the several comfortable hostelries with which the place is provided.

Spending a couple of days there, early last September, I was much interested, one morning, in noting the floral panorama that gradually unfolded itself along the shores of the river as the stream wound through the meadows to the Bay. Embarking in a rowboat at "mine host's" barn, where the "river" was but two or three feet deep and hardly wide enough to admit of the use of the oars, I began the voyage seaward in the dark shadow of a great cedar swamp, from whose shrubby borders the graceful forms of asters would now and again rise to view, or drop their pretty flowers over the limpid, amber waters. *Aster nemoralis* and *A. Novi-Belgii*, var. *elodes* were especially interesting and beautiful, with good sized heads bearing violet rays. The narrow-leaved sunflower (*Helianthus angustifolius*) was also here, its large yellow blooms growing like suns, sure enough, in the woods' shade. And here, too, were some plants of Eryngo (*Eryngium Virginianum*), the gray balls of umbelled flowers jewelled with drops of dew.

As we get clear of the woods and emerge into the meadows bathed in the pleasant sunshine of the early autumn morning, the shores are bright with a luxuriant display of the yellow blossoms of *Helenium autumnale*, one of the most charming of our native flowers, intermingled with the scarcely less attractive *Coreopsis trichosperma*. Upon both margins of the river, the Withe-rod (*Viburnum nudum*) is abundant, the bushes at this season adorned with a profusion of half-ripe fruit, arranged in flat-topped clusters of red and white—a striking display.

As the boat drops further down the stream, purple Gerardias give a dash of lively color to the broad expanse of green meadow, to which, too sober tints are given by patches of brown-fruited rushes and sedges (notably *Cladium mariscoides*), and by the Eryngo's gray heads, which appear again in greater abundance than they did a while ago back in the cedars. Everywhere, along the low shores, dots of white betoken the presence of the modest but ever graceful little Break-rush (*Rhyncospora alba*); and now and then the Cardinal-flower (*Lobelia cardinalis*) flashes a fiery signal to us from the bank. The Arrow Arum (*Peltandra Virginica*) forms populous colonies in the shallows, its fruit-enclosing spathes bent point downward, as though contemplating standing on their heads in the mud. They do, it is said, immerse the fruit, at maturity, in the water in which the plants stand.

When we reach the salt water that flows in from the Bay, there is a distinct change in the shore flora. The broad, wet meadows are here covered with a growth of Salt-meadow grass (*Spartina juncea*) which, when cut and dried, becomes the "salt hay" well-known in the cities; and, dotted through the grass, are the clustered brown spikelets of the Sea Clubrush (*Scirpus maritimus*). The bright-eyed flowers of the Sea pink (*Sabbatia stellaris*) nod gaily at us from the river's brink, and with them is a low composite with thickish leaves and flat corymbs of rayless, flesh-colored blossoms, which is found to be the Marsh Fleabane (*Pluchea camphorata*.) Growing all about in the grass, and liable to be overlooked unless we run our boat close alongside the bank, are the fat little plants of the Seaside Gerardia (*G. maritima*)—a miniature double of the Purple Gerardia—with corollas a quarter to half an inch across, but with leaves of fleshy texture. Here, too is the curious *Aster subulatus*, a maritime species with very narrow leaves, becoming awl-shaped on the branches, and bearing numerous heads of dull flowers apparently rayless, but found, on examination, to possess nearly a double row of ray florets, which, however, do not project beyond the disk. Conspicuous along the banks, are bushy clumps of a plant with the habit of the common elder, but with fleshy leaves and numerous small heads of greenish composite flowers, disposed in racemes and nodding on their stalks. This is the Marsh Elder or Highwater Shrub (*Iva frutescens*,)—a characteristic plant of the seacoast. Both by the river and far away across the salt marshes, the Seaside Solidago (*S. sempervirens*) displays its rich, green foliage and lifts its cheerful panicles of golden flowers, very children of the sun.

Nearing the bay side, we find the meadows all blushing with the presence of the ruddy Samphire (*Salicornia*), three species of which are found on the New Jersey Coast. But a far prettier denizen of these salty meadows, and one which we now find in full bloom amidst the Salicornias, is the Sea Lavender or Marsh Rosemary (*Statice Caroliniana*)—a plant that sends up from amid a cluster of root-leaves, which are delicately reddened and yellowed by the autumn weather, a much branched, leafless stem covered with a multitude of exquisite little flowers, lavender-colored. Gathered and set in a slender-necked vase at home. these flowering branches are among the prettiest of decorations for a mantel or shelf, retaining throughout the winter all their original grace of form and much of their delicacy of color. Close to the water's edge, the tall Salt Reed-grass (*Spartina polystachya*) grows in profusion, crowned with great spiked racemes of flowers. The rank stalks are six or eight feet or more high, growing in dense masses, and looking from afar like patches of close-sown corn. They bend gracefully before the rising breeze from the bay, whose waters being now in sight, our voyage down Forked River comes to a close.

C. F. SAUNDERS.

Philadelphia.

VARIATIONS IN STRAWBERRIES.—Prof. Bailey shows the *Independent* how a new species of strawberry was made. He remarks that he was taken to task for calling it a new "species." He set out plants of the Chilœan Strawberry, received from Oregon, and they—the same plants—developed, in three years, "far away" from the original form. The "far away" consisted in this that instead of a squat, blue-leaved, short-trussed, densely hairy plant, the leaves the third year were "tall growing, green-leaved, high-trussed, and thinly hairy,"

As the writer has seen it growing on the Northern Pacific Coast, the *Fragaria Chiloënsis* is generally found on barren sandy wastes formed by erosion through the glaciers. They are then "squatty" and so on as Prof. Bailey describes his plants to have been. But when some plants are found in richer soil, they grow as the Professor's three-year plants appeared, and many other variations may be seen. That luxuriance will somewhat change characters indicated, is well known to gardeners; but these changes would hardly warrant the claim that it was an argument for evolution. That evolution, in some form, may be a fact, is conceded; but arguments drawn from mere luxuriance do not help the cause.

ROOTING OUT RARE WILD FLOWERS.—Parties who go to well-known localities for rare plants, to root out specimens, write to the papers that some vandal had been there and rooted them all out in advance of their own visits.

ZAMIA INTEGRIFOLIA.—*Coontie*, or *Florida arrow root*. The *Zamia* seems to be a survival of the old order of vegetation, of which we now find representatives in a fossil state. As connecting the present with the past, these plants are especially interesting. The order of cycads to which they belong had many species, and their remains in a fossil condition are found over the greater part of North America. To-day this is the only representative in the United States, and indeed there are but 9 genera and 45 good species found over the whole earth. Our specimen is illustrated from a photo, kindly sent by Anderson and Price, Ormond, Florida, and is fastened to a stake in order to show the whole root structure. As the trunk or root is almost wholly underground, and the plant difficult to get at, many good botanists have never seen the whole plant.

The sexes are on separate plants. This appears to be male, but we have no direct knowledge of the fact.

It is occasionally known as Tuckahoe, though this name properly belongs to quite another thing. Its most usual designation is "Coontie," the name applied to it by the Seminoles.

ZAMIA INTEGRIFOLIA.—Coontie of the Indians.

The pith furnishes a fine form of arrow root,—the "White meal" of the Indians, on which, it is said they almost wholly subsisted during the Seminole war.

It is only found in lower portions of Florida.

Zamia proper is now confined chiefly to the New World. The African forms, formerly included in the genus, are now removed to *Encephalartos*.

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As the writer has seen it growing on the Northern Pacific Coast, the *Fragaria Chiloënsis* is generally found on barren sandy wastes formed by erosion through the glaciers. They are then "squatty" and so on as Prof. Bailey describes his plants to have been. But when some plants are found in richer soil, they grow as the Professor's three-year plants appeared, and many other variations may be seen. That luxuriance will somewhat change characters indicated, is well known to gardeners; but these changes would hardly warrant the claim that it was an argument for evolution. That evolution, in some form, may be a fact, is conceded; but arguments drawn from mere luxuriance do not help the cause.

ROOTING OUT RARE WILD FLOWERS.—Parties who go to well-known localities for rare plants, to root out specimens, write to the papers that some vandal had been there and rooted them all out in advance of their own visits.

ZAMIA INTEGRIFOLIA.—*Coontie*, or *Florida arrow root*. The *Zamia* seems to be a survival of the old order of vegetation, of which we now find representatives in a fossil state. As connecting the present with the past, these plants are especially interesting. The order of cycads to which they belong had many species, and their remains in a fossil condition are found over the greater part of North America. To-day this is the only representative in the United States, and indeed there are but 9 genera and 45 good species found over the whole earth. Our specimen is illustrated from a photo, kindly sent by Anderson and Price, Ormond, Florida, and is fastened to a stake in order to show the whole root structure. As the trunk or root is almost wholly underground, and the plant difficult to get at, many good botanists have never seen the whole plant.

The sexes are on separate plants. This appears to be male, but we have no direct knowledge of the fact.

It is occasionally known as Tuckahoe, though this name properly belongs to quite another thing. Its most usual designation is "Coontie," the name applied to it by the Seminoles.

ZAMIA INTEGRIFOLIA.—Coontie of the Indians.

The pith furnishes a fine form of arrow root,—the "White meal" of the Indians, on which, it is said they almost wholly subsisted during the Seminole war.

It is only found in lower portions of Florida.

Zamia proper is now confined chiefly to the New World. The African forms, formerly included in the genus, are now removed to *Encephalartos*.

INTENTIONAL SECOND EXPOSURE

LINDENS AND HONEY BEES.—Mrs. Wilhelmine Seliger says:—"Page 39, in your March number, about trees and flowers, my observation goes that our honey bees find their especial favorites without their being guided by colors. Then just our colorless blossoms are notably visited by great numbers of bees. Their flowers are those of *Rhus copallina*, and of our sumachs,—also the native woodbine when in bloom, *Ampelopsis* or Virginian Creeper. The Linden trees, too, are humming from the swarms of industrious bees, when they are in bloom, and we cannot really say that their flowers have a guiding color.

In speaking of lindens, I do not find a certain species of it catalogued which of late has received great praise in Germany,—it is the Oriental Linde, *Tilia dasystyla* Stev. (*Tilia euchlora*, (Koch), or the Krim Linde, (Crimea). Also one named *Tilia tomentosa* or the Hungarian Silver Linde."

What has been known as the Hungarian Silver Linden is catalogued in the Meehan nurseries as *T. Europæa* var. *argentea*, and a large tree is on the specimen grounds. It was originally introduced from the Old World as *Tilia alba* of Waldstein's plants of Hungary; and the *T. argentea* of D. C., both of which are now referred to *T. tomentosa* of Moench. But seedlings from this tree have a large number of the common English Linden, pure and simple, among them. The name adopted in the catalogue is therefore, that of DeCandolle reduced to a varietal rank.

Usually it is of no importance to a horticulturist to have the author's names quoted, in connection with a name in general use. In the case of these Lindens, it is. For instance, it is not *Tilia dasystyla* of Stev., but the *T. dasystyla* of Loudon, that is synonymous with *T. cuchlora*.

WILD HAWKWEEDS.—One of our Philadelphia subscribers reports finding *Hieracium aurantiacum* in a wild state at Saratoga Springs, N. Y. This rather pretty, orange-red hawkweed is a European species that has become naturalized in the New England States,—to such an extent, in fact, that it has become one of the farmers' pests in some parts. It is a composite, somewhat resembling a dandelion, its near relative, and seeding freely it is easily scattered. It also increases rapidly by stolons.

Another hawkweed, better known as Rattlesnake-weed, is *Hieracium venosum*. It is plentiful in woods around Philadelphia and throughout the eastern, central States. The growth is taller—about two feet—and there are few or no leaves beyond those directly at the base, which are rather attractive by their pronounced purple veins. Both species bloom all summer.

PASSIFLORA INCARNATA.—A correspondent from Winter Park, Florida, says:—"I was much interested in the article on *Passiflora incarnata* in the February number of the MONTHLY. This is a very common plant in this region, growing along fences, in vacant lots, and in other waste places, and with its odd and conspicuous blossoms is one of our most attractive and interesting spring flowers. The fruit is called "May Pop" by the country people here, and it is often made into jelly, jellifying easily, and yielding a very palatable product.

There are five other species of *Passiflora* found in Florida."

LYCOPODIUM INUNDATUM, AND FAIRY RINGS.—Dr. B. L. Robinson notes in *Rhodora*, that the Marsh Club-Moss, *Lycopodium inundatum*, when growing in damp sand, and with an unobstructed field before it, grows in circular patches resembling a cart-wheel, the living portion at the outer edge of the circle being the rim of the wheel, and the dead portion of previous years resembling the spokes. The appearance is suggestive of the fairy-rings, caused by a species of fungus which progresses, from year to year from one original centre, beneath the surface of the ground, in the same manner.

PREMATURE DEATH OF FOREST PINES.—A Luzerne Co., Pa. correspondent writes that many native pine trees in that section are decaying prematurely, and inquires the cause and a remedy.

Without detailed information, it may be supposed these trees are suffering from a root fungus to which they are occasionally subject. Lime spread on the surface of the ground would destroy such a fungus. The writer knew of a White Pine that the owner was especially anxious to save. In this case, sulphur liberally applied was successful.

GENERAL GARDENING.

JOY FOREVER.

A thing of beauty is a joy for ever;
It's loveliness increases. It will never
Pass into nothingness.
In spite of all
Some shape of beauty moves away the pall
From our dark spirits. Such the sun, the moon,
Trees old and young, sprouting, a shady boon
For simple sheep; and such are Daffodils,
With the green world they live in.

—KEATS.

A PLEA FOR THE EVERGREEN.—"There are three objects in nature." remarked the quaint old doctor, alive to all he may see or hear on his drives through the country, "that are beautiful in infancy, but extremely ugly when grown up, a little pig, a negro baby, and an evergreen tree."

Not denying the truth of the assertion in regard to the first two, I put in my plea for the evergreen. Ever since I gathered the gum from the old spruce in the "door yard" of my childhood home, there has been a tender spot in my heart for all the evergreen family. While they have their place, in town, no country landscape is complete without them.

While the great varieties admit of individual choice, all are pleasing from the lofty wide-spreading pine to those suitable for the lawns of the most unpretentious homes. The spruce, fir, balsams, cedar, Irish Junipers, not forgetting the arbor-vitæ, so useful as screen or hedge.

I delight in the evergreen in the warm summer time as a nesting place for birds. Bluebird, Robin, Oreole, Brown Thrush, Yellow bird, and Fly-catcher for the past three years have enjoyed the seclusion of the sheltering evergreen surrounding our country home, and a friendly pair of Cat-birds have made themselves happy amid the boughs of a large spruce overshadowing our piazza. While his mate has been busy attending to household matters, the male bird has made the air reverberate with his song—and far into the summer night, has he sung on for very gladness,—his lapses, now and then, into catlike calls, only making his clear notes more delightful.

I love the sound of the wind sighing among the branches of the pines. Trees seem like friends with whom you can hold sweet converse without danger of being misunderstood, and the evergreen is no summer friend, but is at its best, when the other trees are leafless and bare.

Was there ever a more beautiful sight than has greeted the eyes looking from our window when "snow bound" some bright sparkling winter morning, the earth so pure and white, every object covered with its mantle of snow. The evergreen, with its pliant boughs drooping with its beautiful burden, all glistening and glinting in the sunshine.

But an evergreen, to be "a thing of beauty," must grow as nature intended,—not with the lower branches lopped off in a mutilated manner, nor trimmed in fantastic shapes as the Yew trees of England.

The dark green foliage of these trees is such a fine background for shrubbery and herbaceous plants. Peonies, lilies, the Yucca and the like,—all flowering bulbs, roses, and many annuals, give the needed coloring to relieve the otherwise too sombre green. By a little careful thought, we can do so much to relieve the dreariness of our long, cold northern winters, by a judicious transplanting of some of our native shrubs and vines.

What more exquisite study in color could one ask for than that given by the soft warm gray of the vine of the bitter sweet, clambering over the Arbor-vitæ hedge, the pale green leaves, and green and white blossom and seed pods, such a pleasing contrast to the deep green of the hedge, all through the winter, what a glow of orange and scarlet from the beautiful berries.

Among the shrubs, we have Barberry and Black Alder, and some of our native thorns. The hips of our June roses and the Sweet-briar, and some of the Wahoo. "The Spindle Tree

Family," are very effective. We have never had given us for our personal adornment any jewel or gem, that has surpassed the glorified brightness of those strings of coral we made from Wahoo berries in the days gone by. If we were only willing to give a few hours of time, and a little labor, and transplant from the woodland a few shrubs, plant a few bulbs, and sow some seeds with the beautiful evergreens, our country lawns can be made very cheerful and at all seasons a joy, and a delight.

Rochester, N. Y. S. W. BOWERMAN.

ENTRANCE TO A CARRIAGE DRIVEWAY.—The approach to a residence is one of the most important considerations that confront the landscape gardener, as first impressions will naturally have effect on later ones.

Some tastes will lead persons to construct massive gate-ways, which in themselves may be truly magnificent, but which in relation to landscape effect will appear out of place unless the artist can so arrange trees and plants nearby to bring all into harmony.

In the case of a large estate, nothing should appear cramped, hence the entrance will be broad and the corners well-rounded. On the lawn, these corners afford opportunity for massing shrubbery; and a little further in from these may be an open group of well-selected trees. The choice of these trees and the future of the shrubbery, are matters of considerable importance. To the writer's eye, the absence of strict formality is desired, and the trees should therefore be graceful, like the elm, Wier's Maple, Cut-leaved Birch, Yellow Locust, etc.; and the shrubs be not continually sheared and rounded.

Evergreens in careful assortment take the place of the shrubs very acceptably, and make the entrance attractive summer and winter; and larger ones may also be used in place of the deciduous trees,—pines are perhaps most fitting.

Vines on walls and gate-posts are always pretty; but especially desirable are the loose-clambering ones like the Virginian Creeper. Let the latter be mingled with English Ivy for a back-ground and winter effect.

Flower boxes for stone posts filled with summer plants and vines can be easily and tastily arranged and are admired by every one. In winter, they may be replaced by evergreens of dwarf nature or small specimens of larger ones, like Himalayan Pine, Lawson's Cypress and Scotch Pine.

The main idea should be to construct the entrance as a whole bringing in pretty features to enliven it and connect all with the estate in harmony.

DESTRUCTION OF THE MOLE.—A subscriber inquires if the mole is strictly carnivorous, and also how to destroy them.

It is customary to consider them carnivorous, though as recorded in a previous volume, they have been known to live entirely on vegetable food from necessity. Just like human beings, they have a preference, and in all probability roots are seldom touched for food. Ground mice are very destructive, and should be blamed for much that is now laid at the door of the mole.

From various reports, it is evident that the same method of destroying moles will not always answer. Some people have success with traps consisting of steel prongs set to spring downward when the mole passes beneath them, the trap being placed over a recent run. A Kentucky correspondent claims to have caught five and six a day with such traps. Others recommend poisoning meat and placing it in their runs. Bisulphide of carbon is also recommended. It is poured into a run, the entrance being immediately covered, while the fumes extend for a considerable distance, killing *the animals it may reach*.

The greatest success of others is to take notice of the times when the moles usually work, set a boy with a spade to watch the ground and dig up where any disturbance of the soil occurs. This is a sure way, and not so expensive and tedious as it may seem without trial.

EARTH WORMS.—A correspondent of the London *Gardening Illustrated*, calculates that in some parts of England, there are 53,800 worms on an acre of ground, and that the total weight of this number would be 356 pounds. They are on the surface at night-time; and one of the pleasures he finds in gardening is watching the work of the earth-worms by lantern light at night. He ranks them among the friends of the gardener, on the whole, though, like other friends, they may prove troublesome at times.

THE MAGNOLIA LOTUS.—NELUMBIUM ALBUM GRANDIFLORUM.—It is not the privilege of everyone to enjoy the lovely magnolia, and but few know it is possible for them to have a flower, magnolia-like, though larger, more fragrant, more graceful and of a richer color than our southern magnolias. Such a rival is found, however, in this noble aquatic plant. Its color is of the clearest pearly white, the outside of the outer petals being blended with cream at their bases; the texture is fine and uniform, as in *N. roseum;* the stamens are long, numerous and prominent; color bright, sulphur yellow. The seed pod is of the same rich color, harmonizing exquisitely with the beautiful waxy pistils. Both foliage and flower are stronger and more bulky than the Egyptian Lotus; the flowers open out wider; the petals are broader and less pointed. It is the largest of all the lotuses, often measuring three to twelve inches across.

The foliage, in itself, is as showy as that of *Caladium esculentum*, and very attractive aside from the flowers. The seed pods are interesting and the seeds pretty; while its whole culture and habit afford a pleasant fascination about it, rarely possessed by other plants.

Its blooming period extends from June to last of September. It is one of the best to cultivate in tubs or half-barrels, and finds no equal in tanks or open ponds. It has proven perfectly hardy everywhere in the United States or Southern Canada, when planted in natural ponds.

The accompanying photo shows a bud, a half open flower, a full bloom four days old, and one of the brown, mature seed-pods with one of the large leaves in the back ground.

I have cultivated every variety of water lilies and think this the finest of the lotuses.

GEO. B. MOULDER.

OAKS AS STREET TREES.—Mr. W. R. Smith says: "Pennsylvania avenue east of the Capitol, Washington, D. C., is planted in the middle with *Quercus palustris*. They are doing well. It is to be regretted that it was not made uniform, as suggested by our dear departed friend Mr. Stiles, who saw, approved, and admired the two rows, a half mile long, of this oak, and said 'how grand it would be if continued to the Capitol.' See Garden and Forest, 1893, for his notes on this subject. *Quercus rubra*, on 12th street, will be a grand double row in the near future, planted four feet from the curb in a continuous strip of parking."

DOUBLE CLEMATIS.—Mr. J. P. Server, Philadelphia, kindly sends a double flower of *Clematis Jackmanni*, from a plant that has hitherto borne the normal single flowers only. The stamens have become petals. It is not known by what law nature works out these vagaries.

MAGNOLIA LOTUS--NELUMBIUM ALBUM GRANDIFLORUM.

DOUGLAS SPRUCE.—A western evergreen specialist, D. Hill, Dundee, Ills., gives highest praise of the Douglas Spruce. He says:—

"This is emphatically the tree for the million. While on a visit to the eastern nurseries, I noted in almost every instance that it was the most rapid grower of all the conifers. Sometimes the complaint is made that it grows too fast and is not compact enough for the lawn tree, yet on my grounds they seem to have the perfection of form. The foliage is soft and somewhat resembles the Hemlock. In the mountains it is a grand tree. It reaches from the Rockies to the Pacific slope, and our Chief of Forestry, B. E. Fernow, tells us that he never on earth saw such a burden of lumber to the acre as that produced by this tree in the west. We are of the mind that the seeds from the Conifers gathered on the Pacific Slope are tender, while those gathered in Colorado produce hardy trees, which endure both drought and cold.

The lumber of this tree is very strong and is invaluable for timber, joists and scantlings, and makes good lumber for finishing, though like the Hemlock, it is easily split. In color it is like the Red Wood of the Pacific Coast.

I want to call your attention to one feature of this tree. In the deep gorges and on the north side of the mountains, as you reach the high altitudes, you will find them of the deep blue type—literally sparkling with silver. Seen at a distance they are often taken for *pungens*."

GEORGE PEABODY ARBOR-VITÆ.—The arbor-vitæ is a useful evergreen in many ways. It is very hardy, besides standing a great deal of heat. For the South, the Chinese kinds are hardly excelled. The common American species is largely used for hedges where a quick upright growth is desired; and as a specimen plant, even, it is rather nice where it is permitted to develop properly. The Siberian Arbor-vitæ is useful for hedging, being of dwarfish, compact growth. Then there are the several kinds of "globe" Arbor-vitæ, which assume a perfect, globular shape. These are valuable in certain forms of gardening.

One of the prettiest, perhaps, of the Arbor-vitæs, is one of the several golden forms of the American called George Peabody. The true plant is of a very bright yellow color, making it of great value to include in evergreen groups. Messrs. Chas. B. Hornor & Son, Mt. Holly, N. J., write that they have specimens six to eight feet in height, which, of this variety, must make very ornamental specimens. The character of growth is of the upright kind, similar to its parent, though it is a much slower grower.

A very interesting variety, which should not be overlooked, is Tom Thumb. From its delicate-looking, heath-like foliage, one would not suppose it an Arbor-vitæ. Like its namesake, it is a dwarf.

PRUNING THE GINGKO.—"Some time ago I obtained a Gingko tree. It is growing well, but the main stem has shot up very high and there is scarcely any lateral growth. Would you advise me to cut off three or four feet from the main trunk in order to induce the growth of the side branches?"

The above inquiry from a correspondent can only be answered after consulting the taste of the owner of the tree. The description corresponds with the usual habit of growth of the *Salisburia*, and therefore many persons would prefer that character for a lawn specimen as being natural and unique. They would not consider making it bushy any more than they would lombardy poplar or deciduous cypress. In fact such a character is distinctly desirable in its place as breaking the sameness of the landscape.

As an excellent street and shade tree, the Gingko is becoming well-known, and it deserves all the praise that has been given it. When so used, it follows that the leader must be stopped to induce bushiness. Then our correspondent's question would be answered in the affirmative, the operation being best performed in early summer when the tree is making growth. The few lateral branches will then be encouraged to extend their growth. If pruned when at rest, the tendency of growth is to become more erect than ever.

SPRAYING FOR INSECTS WITH A FERTILIZER.—There is a two-fold benefit in spraying for scale and similar insects with a solution in which Potash Whale Oil Soap is used. Potash is one of the essential foods of plants, and as much of the spraying mixture reaches the soil as well as the branches and foliage of the trees, the soil is benefited by its application.

NEW OR RARE PLANTS.

HYDRANGEA PANICULATA.—It is some fifty years since Siebold made us acquainted with *Hydrangea paniculata*, a native of the woods of Japan. This is still comparatively unknown to cultivators, though the variety known as *paniculata grandiflora* is very common. It is certainly more obtrusive than the parent species by reason of the fact that, as in the common *Hydrangea*, or *Hortensia*, almost all the flowers are of a petaloid, barren character. In the original species, as shown in the illustration, most of the flowers are perfect, only a comparatively few having the barren characteristics. The flower cymes are, therefore, of a much lighter and more graceful character than in the variety *grandiflora*. The plant also is a stronger grower, and it makes a far more ornamental shrub, than does the well-known variety.

HYDRANGEA PANICULATA.—Flowers Pinkish-white.

NEW DWARF SWEET PEA.—Burpee's Bush Sweet Pea is a novelty on this year's market. As the name implies, it is introduced by W. Atlee Burpee & Co., the noted introducers of sweet peas, of Philadelphia. Their description says of it: "Grows in perfect bush form. Requires no trellis like tall peas, neither does it hug the ground like the Cupid race. An average bush grows sixteen to eighteen inches high, by from twelve to fourteen inches wide. All the flowers are borne on top of the plant, and the proper way to treat this new type will be to plant seed in a row, to make a neat, even hedge, when no support will be required.

Flowers, in form and color, are a reproduction of the famous Gray Friar—watered purple on white ground."

THE HARDY FLOWER GARDEN.

SUCCESSIONAL-BLOOMING BED OF IRIS.—Several correspondents having inquired for information regarding arrangement of iris beds, borders, etc., the following is given in response.

A narrow bed along the center of a walk is requested—dimensions 50 feet long by 2½ feet wide.

This would be such a narrow bed, the plan must necessarily be carefully made. Different species of iris vary in height of growth from 3 or 4 inches to 3 feet; and flowers may be had from early spring until late summer. The bed as a whole should be made up of plants that range 2 or 2½ feet in height, taller ones being interspersed, where desired, in very small groups or clumps, and the dwarf ones will form the border.

The Japanese Iris (*I. lævigata*) are among the tallest of the species, averaging perhaps two and a half feet. The flowers of this type are distinct and remarkably beautiful. Either this or varieties of the *Germanica* will be the prominent feature of the bed—the choice may rest with the owner. Another tall species is *I. pseudo-acorus*, flowers a pure yellow; it blooms later than the German and before the Japanese.

Louis Van Houtte is a tall German variety, and very pretty, the petals being white, prominently margined with veins of blue. *Belamcanda punctata*, Blackberry Lily, a close relative of the *Iris*, is excellent to intersperse, furnishing bloom (in the locality of Philadelphia) from June to September. Height 2½ to 3 feet, slender.

The arrangement of varieties of German or Japanese will depend on the colors obtainable. The writer of this has found a difference in the blooming season between varieties of the German, the earliest preceding the latest by six weeks. *Iris florentina*, white, is also early, as well as *I. Pallasii* and *graminea I. cuprea* and *Sibirica* are among the later ones.

Coming to the border or edging of the bed, we have more uncommon species to deal with. They are or should be well-known, but in

CLEMATIS DAVIDIANA.
Flowers Blue.

America they have not been very generally used. *Iris cristata* is a charming native species, growing to less than 6 inches in height. *Iris pumila* is a dwarf European which, with *cristata*, is one of the first to bloom. These furnish many variations of color. *Iris alata* is practically unknown in American gardens. It grows just a little taller and blooms latest of all. In arranging the border, it would be well to have every second plant *alata*, alternating the other two, and setting *alata* back a little from the line of the others.

Spanish Iris, *I. Xiphium* and *I. Histrio* may be interspersed throughout the bed. They both bloom early, the latter in advance. Being small-rooted, inclined to bulbous, they take but little room, and need not have space provided for them in the plan.

In allotting space, nine inches square each for the main portion, and not more than six for the border, would make an effective bed soon without crowding them.

HYBRIDIZING DAFFODILS.—By crossing the different species or forms, we get some lovely hybrids. Some are splendid in form and color combined, with sweet-scented properties. There is no very great difficulty in hybridizing the Narcissi, as there is in some of our stove and greenhouse plants. All that is necessary is to remove the stamens of the flower you are going to operate on with a pair of tweezers or sharp-pointed scissors before it is fully expanded.

Morning is the best time, as the pollen is not so ripe as later in the day, when the flowers are expanded. Dust the pollen of the variety you are going to cross with on the stigma of the flower that is to be the seed-bearing plant; label it, and put a stake to each flower so hybridized, so that the wind may not break it off.

—*Journal of Horticulture.*

CLEMATIS DAVIDIANA.—Clematises are well known as handsome woody climbing plants,—but there are a number of them that are beautiful herbaceous plants, and among these the one now figured from *Gardening Illustrated* is a very pretty example. It is a Chinese plant, and received its name in compliment to Mr. David, an eminent botanist, who has done much to enlighten us on Chinese botany.

The leaves resemble some of the umbelliferous plants,—indeed, *C. Davidiana* is believed not to be essentially different from the cow-parsnip clematis, described many years ago as *C. heraclæfolia*, by De Candolle.

FRUITS AND VEGETABLES.

MUSHROOMS ON LAWNS. — A Philadelphia correspondent desires to have Mushrooms grow among the grass on his lawn, and asks how to go about "sowing the seed." The mushroom "seed" is the fine black dust that is expelled from a ripening mushroom. It takes profound gardening skill to get these to grow, and it is only attempted by those who make virgin spawn a business. Spawn is the real mushroom plant of which the mushroom itself is the inflorescence. This is the cob-web-like material that gives the mushroom-odor to the earth in which mushrooms grow. It is not destroyed by dessication; but will live for years in a condition of absolute dryness. In this state the plant is sold by seedsmen in the form of mushroom bricks,—the plant having been made to grow thoroughly through the brick material, before entirely dried. These bricks are broken in pieces about the size of walnuts, and planted by those who cultivate mushrooms. Broken in pieces and planted in the lawn, the correspondent could have mushrooms. But, a little gardening knowledge is necessary. If planted at the wrong time, the spawn would rot away. It will only start to grow under a temperature of 60°,—and should be planted only when the soil is in a condition for the spawn's growth. The proper course to take is to test the earth by a thermometer about mid-summer, and, when the earth is found to be about this temperature, set out the brick pieces between one or two inches deep, treading the loosened earth compactly after the planting. Old grassy lawns are better than young ones, for it is believed that the fungus on dead grass roots favors the development of the mushroom fungus.

STRAWBERRY, ELEANOR.—Several months ago, an item headed "Eleanor Strawberry," strayed from its caption, and said nothing about that berry. Although we did not directly introduce this variety, it originated here, and we first brought it to the notice of the introducer, and naturally take a special interest in it; but independent of all this, I have never found a better berry in quality, either early or late. It is a vigorous-growing sort, making plants quite freely, but on very short runners; and the foliage is very healthy and the berries, with us, are large and hold their size well through the season. As a second early, we give it first place, and we have tested a great many varieties. Of course, no one variety will succeed equally well every where, and in watching reports from various sections, we find Eleanor very highly praised by some and condemned by others.

Hammonton, N. J. WM. F. BASSETT.

PROLIFIC STRAWBERRIES.—Prof. S. T. Maynard, of Amherst, Mass., says: "The yield of eight leading (strawberry) varieties this season stands as follows, each plant all the same size: Sample, 461 oz.; Brandywine, 362 oz.; Howard No. 14, 350 oz.; Gandy Belle, 327 oz.; Glen Mary, 326 oz.; Maximus, 309 oz.; Isabella, 306 oz.; Clyde, 299 oz. The Clyde did not do as well as it promised on account of wet weather. The Sample we class as medium in quality and above average in size. This is for rather heavy soil."

CLOSE ROOT-PRUNING TREES.—It must be evident to all who grow wise with years that the true philosophy of success in tree planting is not yet perfectly understood. It is not uncommon to see trees furnished with what the planter regards a magnificent mass of roots, and planted with the utmost care and skill prove astounding failures. Indeed, deaths among well rooted trees are often in greater proportion than trees that have what might be termed very poor roots. Why should this be?

This question derives more importance from statements made by responsible parties that fruit trees with the roots severely pruned are more successful than trees with the ordinary supply. Old planters shrug their shoulders at this, and well they may. Still, it is proper to see what there may be in the novel suggestions.—

Prof. J. Troop, of the Indiana Experiment Station, says:—

"In order to determine whether close root-pruning would be suitable for this climate or not, an experiment was begun on a small scale last spring in which four trees each of standard and dwarf pears, Early Richmond cherry, German prune, peach and quince were selected for trial. The trees were two years' old and as uniform in size as it was possible to get them. Two trees of each of these varieties were pruned so that not more than an inch or two of the roots remained, and the tops were entirely removed. A hole with a two-inch stick was all that was needed in setting. The other two trees were planted in the ordinary way, leaving all the roots on the tree. Before planting, the trees were all photographed, and after they had completed the season's growth they were taken up and photographed again.

The result of this experiment showed that the peach was capable of producing a magnificent root system and a top to correspond, even after being deprived of all its roots and

branches at the start. The dwarf pear also made a fine growth, producing a finer root development than the trees which were not pruned. The standard pear was not quite so good, and the German prune and cherry were next in order. The cherry made but very little growth, barely enough to maintain life. The quinces both died."

There is one thing we may remember in all this, that is, until the old roots throw out the new white fibres they are of no manner of use to the transplanted tree. This being granted, it is a fair question whether pruning roots will or will not favor the desirable new white fibres. Continued experiments may result in great practical value.

HYBRIDIZING APPLES AND PEARS.—At the recent meeting of the New Jersey State Horticultural Society, among other things was discussed the tendency of the Kieffer Pear to bear shyly when planted by itself. The experience of many present tended to show that when the same pear is planted in close proximity to other varieties of the same fruit, the defect is remedied and the result is a full crop.

One man stated that he cross-fertilized an isolated tree of this variety by taking the flowering branches of other varieties, while in the proper condition, and putting them in jars filled with water and suspending them on the tree, letting the insects and the elements do the rest.

The result was a full crop from a tree that before had never given satisfaction.

The climax was reached, however, when a certain gentleman claimed that his trees were abundantly and successfully pollenized by the flowers of an adjoining apple-orchard. His assertions were met by a storm of the loudest protest, the point taken against him being that such a pollenization or hybridization was contrary to nature's known laws. Now I claim that while the hybridization of the pear and the apple may not be an accomplished fact, they are not so widely separated, botanically speaking, as to render such a thing an impossibility and without parallel. The pear, *Pyrus communis*, and the apple, *Pyrus Malus*, are in the same genus, (some recent authorities, I believe, separate them.) Hybridization is one of the great advancements of the times. The conditions must be favorable and often times delicate manipulation and great skill are necessary to bring them around. But the question I would like to ask is: Do you consider that the fertilization of the pistil in the pear by the pollen of the apple contrary to nature's laws and without a parallel?

Morris Plains, March 10, 1899. E. REAGAN.

Pyrus communis, the pear, and *Pyrus Sinensis*, the Sand Pear, are distinct species; yet the seed from the Sand Pear growing near the Bartlett variety of the common pear produced the Kieffer. It is conceded to be a hybrid, though this has never been demonstrated. It is not improbable that the apple and pear might hybridize, and it is surprising that no actual test has been made. Guess work, such as comes from planting trees side by side, is unworthy of true science.

NEW LAFAYETTE PEACH.—E. C. Rogers, Ohio, says: "The evidence of our best men testifies and time will prove that our Lafayette seedling peach exceeds in strength and growth of tree, beauty and productiveness of fruit, the famous Elberta Peach."

It would be no mean accomplishment to excel the Elberta—a variety which meets with so much favor everywhere and which MEEHANS' MONTHLY cheerfully endorses."

NEW HARDY EDIBLE ORANGES.—Under the auspices of the U. S. Department of Agriculture, effort is being made to produce hardier varieties of the orange by hybridizing with what is commonly known as the Hardy Orange, *Citrus* or *Limonia trifoliata* (properly *Triphasia Aurantiola*). Already, about 150 hybrids have been secured between them.

MARSHALL STRAWBERRY.—A favorite strawberry with T. J. Dwyer & Son, Cornwall, N. Y. who are large growers of small fruits, is the Marshall, which they claim brings a better price with them than any other variety,—a good recommendation.

MARVIN CRYSTAL CURRANT.—J. C. Vaughan, Chicago, Ill., says the comparatively new Marvin Crystal Currant is a very strong grower and exceedingly prolific. The white fruit is moderately sweet and contains few seeds.

BIOGRAPHY AND LITERATURE.

THE VIOLET QUEEN.

The violet in her green-wood bower
Where birchen boughs with hazels mingle,
May boast itself the fairest flower
In glen, or cope, or forest dingle.
—SCOTT.

DOWNING'S FRUITS OF AMERICA.—It is said that Prof. J. L. Budd, is to prepare an edition of Charles Downing's Fruits of America. No labor more acceptable to fruit culturists could Prof. Budd undertake.

LOCAL BOTANY.—Dr. J. W. Harshberger, of the University of Pennsylvania, has prepared a biography of some 93 botanists, who have been useful in advancing the science in and around Philadelphia, during the century just passing away. There will be photographs of 50 of these. If he get enough subscribers at $4.50 each, the work will be published.

THE PRUNING BOOK.—By L. H. Bailey, New York, Published by The MacMillan Co. This is a duodecimo volume of 536 pages, giving Professor Bailey's views of the advantages, disadvantages, and the whole philosophy of pruning as he understands it. It is confined mainly to the management of fruit trees, and will be found a useful manual of reference to all interested in fruit culture.

DR. I. A. LAPHAM.—Dr. I. A. Lapham, one of the great men of science of whom our country is proud to honor, is not forgotten by his adopted State of Wisconsin. A bust to his honor was recently unveiled in Milwaukee, in connection with the great museum, there, which Dr. Lapham did so much to found. To botanists, he will be ever remembered by the pretty genus of compositæ, *Laphamia*, which Dr. Asa Gray named for him. The great public may hold him in grateful memory by the grand weather predictions which he originated. In the language of the orator of the day at the unveiling:—

"I think it is well to turn aside an hour from the din and bustle of the city," said he, "and pay tribute to the memory of one who did so much for our city and state, and did it in a manner so quiet, so modest, so unobtrusive, so self-sacrificing and so unselfish. I have sometimes thought that there is more to be learned from such a life than from all the ponderous volumes filled with the rise and fall of empires, the changing of dynasties and the shock of armies."

He was born in Wayne County, New York; and died in Milwaukee, in September, 1875.

FERTILIZERS.—By Edward B. Voorhees, New York, Published by The MacMillan Co. This is a small duodecimo volume, comprising 327 pages, and goes over the whole question of fertilizers. The author is well-known as the Director of the New Jersey Agricultural Experiment Station. As well expressed on the title page, the source, character and composition of natural, homemade, and manufactured fertilizers, are thoroughly investigated,—and suggestions as to their use for different crops and conditions made in each instance.

NICHOLAS OHMER.—"Rotation in office" is the battle cry of the politician,—not so much advocated, however, by the Ins as the Outs. Horticulturists, however, usually follow the Scriptural advice to hold on to that which is good. This is well illustrated by the election, for the 31st time, of Mr. N. H. Ohmer, as President of the Montgomery Co., (Ohio) Horticultural Society. Possibly no one can show so long a period of popular appreciation expressed in so pleasant a manner.

PLANT FOOD.—The Supervising Committee of the Experiment Farm at Southern Pines, N. C., have just issued a very valuable and important work on "Plant Food." The book is well printed and handsomely illustrated with many fine pictures. It would pay cultivators to read this book, which, we understand, can be obtained free by sending to the Director, Experiment Farm, Southern Pines, N. C.

FOX-GLOVE.—As you have already stated in the February number of your magazine, that Mr. A. Alexander, in a paper upon the fox-glove, appearing in the *Canadian Horticulturist* "thinks that the name fox-glove comes from being like the finger of a glove, but like all authors, omits to tell us how foxes wear gloves." It perhaps may prove interesting to hear the explanation of the first half of the name given by one author.

According to Burgess, in his "English Wild Flowers," this name of fox-glove is but a corruption of folks- (*i. e.* fairy) glove.

Knowing this, we can easily see how the name has become corrupted, and how, in the beginning, it was in no way intended to be connected with Sly Reynold.

Brooklyn, N. Y. ALICE CLARY EARLE.

LANDSCAPE GARDENING, AS APPLIED TO HOME DECORATION.—By Samuel T. Maynard, New York, John Wiley & Sons.—Prof. Maynard, in this treatise on Landscape Gardening, does not enter deeply into the abstract principles that underlie the art,—but devotes himself mainly to the instruction of those home-makers who are trying to beautify their own grounds, so as to aid them in their selection of ornamental trees and fruits, and get the most real enjoyment out of their care and cultivation. An admirable index, makes the book one of great value for reference.

THE PRINCIPLES OF AGRICULTURE.—Edited by L. H. Bailey, New York, Published by The MacMillan Co. Prof. Bailey notes that since the establishment of agricultural colleges, agriculture has come to be regarded as a science, —but that it is really a business and not a science. A knowledge of scientific principles related to any business is, however, an aid to success. Business, Prof. Bailey says, cannot be taught, but the laws of science applied to farm management can be taught. These laws constitute the Principles of Agriculture,—the object of this useful work.

DOUGLAS SPRUCE.—The *Forester* says there is a Douglas Spruce, near Astoria, Oregon, 39 feet in circumference, and 300 feet high.

AMERICAN PARK AND OUT-DOOR ART ASSOCIATION.—Copies of the reports of this association are for distribution to members only.

GENERAL NOTES.

ABIES NORDMANNIANA. — *Abies Nordmanniana* is the chief favorite fir of M. Everaerts. He says it is the most picturesque of all and very accommodating to conditions. Its aspect is noble and it is at the same time graceful.

—*La Semaine Horticole.*

CATALOGUE EXAGGERATIONS.—A correspondent sends us a letter received from a respectable firm, in reply to a remonstrance against a grossly exaggerated account of a newly introduced plant. The reply seems to indicate that, as they simply copied the account of the plant as formulated by the original introducer, they were not blameable, as they always "returned the money when goods did not come up to representation." Our correspondent thinks this an insufficient defence, and we agree with him. The opportunities for getting accurate information are now so abundant that there is no need of depending on second-hand information.

Another source of complaint is the practice, in some quarters, of giving new and sensational common names to plants, by catalogue-makers, when they already have well-known popular ones. In defense of this, it is argued that any one has as much right as another to give a plant a common name; on the other hand, it is argued that when a name is changed in this manner, the catalogue-maker must not complain if the public should suspect the change was made especially to deceive and not to give a name merely.

CLIMATE OF SOUTH AFRICA.—P. M. O., Capetown, South Africa, writes:—"Our dry atmosphere is very hard on American deciduous trees with their stomatic system, suited to a semi-saturated atmosphere. Our native trees are not deciduous, except in rare instances, and these few are up to all sorts of dodges to avoid excessive evaporation."

WART CURES.—Our grandmothers' gardens were not complete without some species of milk-wort to take away worts. The one most frequent was *Euphorbia Cyparissias*. *Popular Science News* says that a piece of fat bacon, rubbed once on the wort and thrown away, is just as effective.

ECHINOCACTUS SETISPINUS

ECHINOCACTUS SETISPINIS.

PINE-APPLE CACTUS.

NATURAL ORDER, CACTACEÆ.

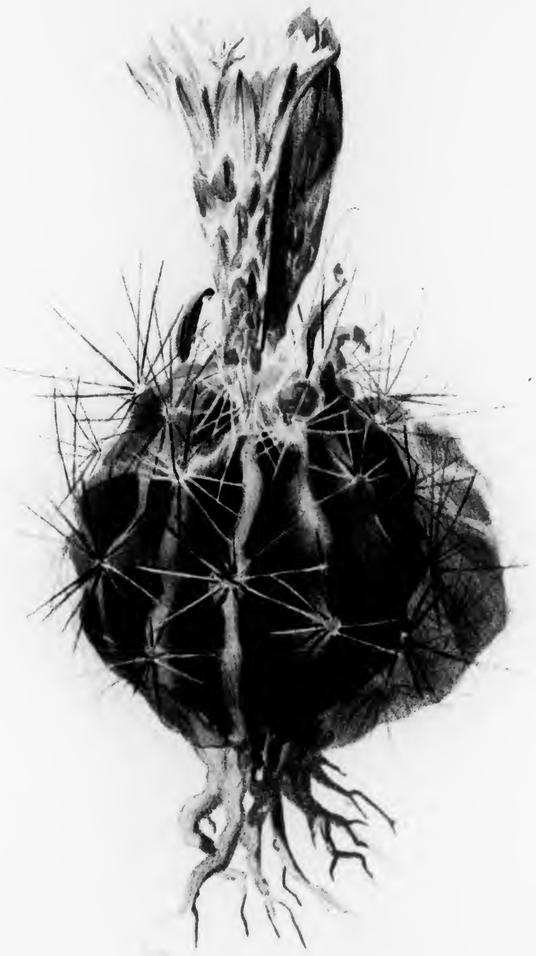
ECHINOCACTUS SETISPINIS, Engelmann.—"All the forms of this species collected by this commission are characterized by thirteen narrowly-compressed ribs, slender flexible spines, small red globose fruit, and globose-obovate oblique strongly tuberculated seeds, with an almost circular basilarhilum. The heads are globose, or usually lengthened or almost cylindrical when old, but sometimes depressed; spines short or long, the central spine usually somewhat longer than the others, but, in some specimens from the Rio Grande, shorter, in others from Eagle Pass, much longer than the others, and erect, sometimes hardly curved. Seed usually 0·6 of a line long. Engelmann, in the "*Cactaceæ of the Mexican Boundary Survey*.

This pretty cactus was first named and described by Dr. Engelmann in an account of the plants collected by Lindheimer in Texas,—*Echinocactus setispinis*,—the specific name being suggested by the setiform or slender thread-like spines. The later description, from the report of Lieut. Emory's Mexican Boundary Survey, issued in 1859, is chosen to accompany the illustration, because it has a good plain figure of the plant,—and because it shows the reader how much and in what lines variations may be expected. In addition to the many points of variation noted by Dr. Engelmann, it will be observed that Engelmann's figure represents the flower as having a somewhat tubular, trumpet-shaped outline; the one given here is nearly bell-shaped. The edges of the ribs are somewhat wavy in our illustration,—while in Dr. Engelmann's they are perfectly straight. A number of species have been formed on the strength of these slight variations; but are remanded to the list of synonyms in Watson's "Bibliographical Index."

It may be here remarked that not only do plants differ in many respects individually in the characters which distinguish them as species and varieties, but also in their behavior. A good illustration is furnished by this species in comparing the author's field notes with the notes made on the specimen illustrated, the plant for which was furnished by Mr. Robert Phifer, of Danville, Virginia, the exact locality in Texas from which the original was collected not being recorded. The field note, dated June 14th, says:—"The plant is somewhat oval, and the flowers come from the apex. Expanded flowers about three inches across. Flowers commence to open at about 9 a. m. Sepals very narrow, greenish yellow, gradually tapering to a sharp point. Base of the petals brownish red, as are also the base of the filaments,—while the upper part of the filaments and the anthers are yellow. The style extends from a quarter to half an inch, beyond the stamens,—the lobes of the style are about eight lines wide by four lines long. The sepaline scales are yellow shading to pink, with white margins. The same flower appears to close and open on three successive days."

The notes made on the plant from Mr. Phifer were made on August 16th,—the plant flowering in Philadelphia. "Plant globose. Flower about three inches long. Petals and sepals about the length of the tube. Upper part of the tube about an inch wide tapering to less than a quarter at the base. Scales short, ovate, sharp-pointed, green with a white transparent border, the upper portion pink. Sepals and petals linear, green on the outside, tipped with purplish-brown, about 30, tapering to a sharp point. The flowers commence to expand at 12 M. and close about 3 P. M. Expanded flower greenish yellow, orange crimson at the base. Filaments extremely slender, lower portion crimson, upper portion yellow. The outer stamens expanding only, and sensitive when touched. Style rather thick for the genus, extending a quarter of an inch beyond the stamens. Stigmatic lobes rather slender and recurved, about a quarter of an inch long, yellow. There are twelve radial spines, the three upper ones shorter than the rest, all slender and hairlike (setiform),—the central spine is about an inch long, blackish, the upper portion whitish and hooked." The difference in the time of open-

COLOR PLATE



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COLOR PLATE
INTENTIONAL SECOND EXPOSURE

ing may be due to atmospheric conditions. Mr. Geo. Long, of Troupe, Texas, informed the author that, in that section, the flowers only open under sunshine. They are usually ovate oblong as growing there, and from that fact receive the common name of "Pine-Apple Cactus." Mr. Blanc, of Philadelphia, a well-known amateur in cactus cultivation, reports the flowers as delightfully sweet-scented, a fact overlooked by the author, and a circumstance rare among day-flowering species of the order.

In other respects, this beautiful species has characteristics peculiar to itself. A large number of the members of the family open all their flowers during a few days in the year only, and then rest for another season,—but this one commences to flower in early spring, and flowers can be found on large plants from thence on through most of the summer season. Others again, after the flower fades, have the fertilized seed-vessel remain at rest till the year following, when a second growth occurs simultaneously with the opening of the new season's flowers, when ripe fruit and flowers are seen together,—only those whom nature has favored with the secret knowing that the fruit made its start the preceding year. In this case, the fruit goes on at once, perfecting after the flowers wither, and thus the bright holly-like berries add through the whole season to the beauty which the flowers furnish.

Of late years, the behavior of plants and flowers, has become one of the most interesting studies in popular botany, and the reference made, in another paragraph, to the sensitive stamens in this species of cactus, brings up the curious question as to the object or purpose of this motion. Sensitive leaves have long been known; but so far as the author believes, sensitive stamens constitute a modern observation. The author of this chapter published his first contribution to scientific literature, in 1841, detailing the movements of the stamens, when irritated, in *Portulaca;* and has since observed that the same movement occurs in the stamens of the common Purslane, *Portulaca oleracea*. It was further noted that the stamens of the common hardy cactus, *Opuntia Rafinesquii*, had the same peculiarity,—and since then it is found to occur in other members of the cactus family, but only in those that open broadly under bright sunlight. Just why this movement is correlated with the sun's rays is a problem yet unsolved, and is a good theme for some wide-awake student in vegetable biology. When these movements were first recorded, shrewd guessers saw the explanation in a special attempt of the flower to secure fertilization. On being touched, the irritated stamen rose and embraced the stigma and deposited pollen there. Since then the tide of fancy hypotheses has flowed in the opposite direction. The prevailing notion is that flowers seek to avoid self-fertilization. There is yet a chance for some fame-loving investigator to clear up the mystery.

Very little has been placed on record of a popular character in relation to this pretty species. The systematic botanists have given us nearly all we know of it. Dr. Engelmann states, in the work cited, that the geographical range of this species is from the Brazos south to the Rio Grande, and west to near the San Pedro. As regards its behavior at home, Mr. Wm. Tell, of Austin, Texas, tells the author that it is not found scattered here and there as so many species are,—but when found they are in groups of a few hundreds together, and often in company with *E. caespitosus* and *E. Texensis*. When growing under large trees, they are usually alone, and are often found close up to the trunks. They continue to flower and mature their berries all summer, the flowers continuing open nearly all day, and are not at all particular about the condition of the weather as to their opening. *Mammillaria Nuttallii* is often a companion plant in that section.

In the dry deserts of the southwest, numerous species of the genus are found. Some confine themselves to low levels, others clamber rocky mountain sides, and often are the only ornaments of some craggy rock.

"They tremble on the mountain height
The fissured rock they press,
The desert wild, with heat and sand,
Shares, too, their blessedness,—
And whereso'er the weary heart
Turns in its dim despair,
The meek-eyed blossom upward looks
Inviting it to prayer."

The desert traveler would feel lonely indeed, without the company of cactuses,—at least in America.

EXPLANATION OF THE PLATE.—1. A whole plant painted at mid-summer. 2. Showing the arrangement of the spines, and the position of the flower-bud.

WILD FLOWERS AND NATURE.

THE WILD COLUMBINE.

"And from the rock-cleft rude
Up springs, with nodding bells, the columbine,—
And round her ever, in the solitude,
The wild bee's winglets shine.

Around ye we may hear
A slumberous summer-murmur faintly swell,
Like that which melteth in the listener's ear,
From winding ocean-shell."

—HOWARD WORCESTER GILBERT.

UNSCIENTIFIC FLOWER HUNTING, AND NOTES FROM A BOTANIST'S BOOK-SHELF, DURING AUGUST AND SEPTEMBER, NEAR ELBERON, N. J.—"Ye don't know nothing, and what ye du know ye don't know sartain." This is our text, and we must beg our readers, if we are fortunate enough to have any, to bear it in mind.

At this season, people sadly shake their wise heads and say, "the wild flowers are over," and we add under our breath for politeness' sake, "Oh, yes, all over the fields and meadows." The wild flowers of New Jersey are a constant delight to a flower hunter and it is good to know that our lines have fallen in pleasant places. At Pleasure Bay the flowering Spurge and Sea Pinks are in their best gowns, and there you can find at least two kinds of *Sabbatia*, or Sea Pink. The *Sabbatia angularis*, much the largest and finest, seems to love Bay Head better than either Elberon, or Pleasure Bay. "Garden and Forest" is very interesting about it, and tells this pretty story. "No more beautiful flower grows in New England than the *Sabbatia*, and at Plymouth, where it is especially profuse, and luxuriant on the borders of the ponds so characteristic of that part of Eastern Massachusetts, it is held in peculiar affection, and one may almost say reverence. It is locally called 'The Rose of Plymouth,' and during its brief season of bloom is sold in quantities on the streets of the town, and used in the adornment of houses and churches. Its name comes from that of an early botanist, *Tiberatus Sabbatia;* but this well established truth is totally disregarded by local tradition. Almost every one in Plymouth firmly believes that the title is due to the fact that the Pilgrims of 1620 first saw the flower on a Sabbath day, and, entranced by its masses of pinkish lilac color, named it for the holy day. Indeed, this belief is so deeply ingrained in the Plymouth mind, that, we are told, strong objections are made if any other flowers are irreverently mingled with it in the church decoration. Yet the legend was invented not more than twenty-five years ago by a man whose identity is still well remembered, and that it is of even more recent origin than the one still more universally credited, which says, 'that the Pilgrim Fathers landed upon Plymouth Rock.'" Shark River could tell many a tale of the Sundews and dear little American Cranberry vines on its green, mossy banks. The thread Sundew with its charming pink flower is always a wonderful sight growing in great masses along this river's edge at Avon. The round-leaved Sundew has a white flower, and is a study with its funny ways and curious appetite for insects on which it likes to dine and sup. It lived on First Avenue, Asbury Park, last year, but like many a good neighbor, may have changed its abode since then.

The "Garden and Forest" for August 18, 1897, says, "Among the *Desmodium* of the hour, there is one exceptionally delicate beauty. This is *D. acuminatum*, with large three-foliate leaves, and rising far above them, a long, and very slender stalk bearing a loose panicle of little pea-shaped blossoms of the loveliest rosy hue. Growing on the border of the woods a cluster of these Desmodiums looks like a swarm of tiny bright pink butterflies poised at some distance from the leafy level below them."

This delightful little flower is dancing away in most of our woods, and can be seen from a carriage with great comfort as it has roadside tastes; and near by grow the Iron Weed, Bone-

set, Joe-Pye Weed, Beggar-ticks, and Butterfly Weed the most cheerful of wild flowers. Mrs. Wm. Starr Dana tells us that "few if any of our native plants add more to the beauty of the Midsummer landscape than the Milk Weeds, and of this family no number is more satisfying to the color craving eye than the gorgeous Butterfly Weed, whose vivid flower clusters flame from the dry sandy meadows with such luxuriance of growth as to seem almost tropical." Then, as a shock to a Philadelphian, she tells us "Oddly enough, at the Centennial Exhibition, much attention was attracted by a bed of these beautiful plants which were brought from Holland. Truly, flowers, like prophets, are not without honor save in their own country." Then we must not forget the Michaelmas daisies, although it is early days for them. "Their beauty has given them a place in English shrubberies, where they bloom at Michaelmas, when the farmer eats his goose, and they are gathered to trim the church on the double festival, the purple being called Michaelmas daisies, and the snowy white species, All Angels." St. Andrew's Cross and St. John's Wort, both of the same family are now as yellow as gold, one close to the woods, and the other in meadow and field. Catnip is ready to serve its cup of tea, and the cats that live nearby are enjoying the feast, fit for the gods, they think.

The Cardinal Flower, if it runs on schedule time, is due in August. This plant is strictly indigenous to America, and, as Caroline A. Creevey says, "Cannot hide, if it would, any more than a scarlet tanager can hide itself in the trees;" and while I am quoting, I will add but another line from Mrs. Dana: "The early French Canadians were so struck with its beauty that they sent the plant to France as a specimen of what the wilds of the New World could yield. Perhaps at that time it received its English name which likens it to the gorgeously attired dignitaries of the Roman Church." The funny yellow or orange-colored Dodder is now feeding upon many an innocent plant, and sapping its meadow life. In England, they call it by many an unpleasant name "Strangle-tare," etc., and then as if to throw a crumb of comfort to the Dodder family, in certain places it is known as Lady's Lace, and Love Vine. Dr. Erasmus Darwin wrote about it a hundred years' ago.

"The fair Cuscutae please with labored elegance and studied ease,
With shy approach they spread their dangerous charms,
And round their victims wind their wiry arms."

The Arrow-head and blue Pickerel Weed are both in their glory and add to the wealth of stream and marsh; and near by them may be found the Turtle-head and Traveler's Joy.

In Gerarde's Herbal, London, 1597, in speaking of *Clematis Vitalba*, he says, "These plants have no use in Phisicke as yet found out, but are esteemed only for pleasure, by reason of the goodly shadows which they make with their thick busling and clyming, as also for the beauty of the flowers and the pleasant scent or savour of the same." Lucky the mortal who finds the white fringed Orchis, and the nymph-like Adder's Mouth with its smell of violets. Both are holding high court in the swamps near Asbury Park. The Sweet Alder or *Clethra alnifolia* is filling the woods with fragrance, and adds to our Midsummer list of good things. Golden-rod is beginning to wave its head above its neighbors, but it seems almost rude for it to appear at this season, suggesting packing and homegoing; but, on they go, there really seems no end to our wild flowers, and yet the wise old heads shake, and shake, saying, "The flowers are over, we must wait for another year." Ask the fields if they are over, and they will give you a true answer and tell each one of us more than book or pen.

Elberon, August 1, 1898. E. W. L.

Some of Our Wild Flowers.—Few persons, I think, realize the beauty and wealth of our native wild flowers, although I have noticed with the utmost pleasure, a fast growing interest in botany, which seemed first manifested in the great project of our New York Botanic Gardens at Bronx, and which has since been steadily increasing.

At this season of the year and, indeed, until November, the country abounds in a succession of flowers, the beauty of which surprises many floriculturists; and if we expect to derive our full measure of enjoyment during the summer months, we should not fail to provide ourselves with a specimen box, microscope and Mrs. Dana's invaluable little book, entitled, "How to Know the Wild Flowers."

Thus equipped, the country lies open before

us, rich in unimagined treasures, species innumerable and to be had only for the searching. Long Island, the great garden of our northern orchids, at this season affords the student ample means of studying. Cypripediums, Arethusas, Calopogons, all in their first bloom in wood and swamp.

To the flower enthusiast, probably no one flower possesses a rarer charm than the Pink Lady's Slipper, *Cypripedium acaule*. Growing, as it does, fairly in our pathway through the oak woods, it seems strange that it should escape general notice. Yet a friend, last spring, seeing a huge bunch of these orchids upon my library table, exclaimed at their beauty and asked their name, adding, "certainly they are from the greenhouse and I suppose would not live out of doors."

This same friend, I met a few days later, driving through the wood where I had come to gather a fresh supply of the Moccasin Flowers, but apparently her eyes were not susceptible to their strange attraction and she passed them by, unnoticed.

The Moccasin Flower, pale lavender-pink and fragrant, springs up through the fallen oak leaves bearing a solitary flower on a scape from six inches to a foot high. Two leaves, close to the ground, are always present, stiff and green and rather hairy. They are deeply ridged. The flower, itself, a true *Cypripedium*, may be easily recognized as such by anyone who is familiar with the cultivated *C. insigne* and *C. Spicerianum* displayed in such profusion in the shop windows of Messrs. Siebrecht and Wadley, New York.

The perianth is six-parted, the sepals being of a dark, purplish brown which contrasts strikingly with the large pink lip, sometimes more than two inches long and heavily veined with purple.

Blooming often in proximity to the Moccasin Flower, is the wild lupine, *Lupinus perennis;* its bright blue and pink-striped, pea like flowers, however, seek a sunny place and I find a long line of them just upon the edge of a wood, where they thrive every summer, in a very dry, sandy soil.

In early June, we are fortunate if we succeed in finding the dainty, pale, pink-rose pogonia (*Pogonia ophioglossoides*) and the darker Magenta Calapogon (*Limodorum tuberosum*). The former grows on a stem from four to twelve inches high, generally bearing one leaf; the flower is small, sometimes not an inch in length, but exceedingly fragrant, and although it seeks, like the Arethusa, dangerous company, in poison Sumac and Ivy, yet one is tempted to brave many dangers to procure it.

The Calapogon I have found in very marshy places, growing, in fact, in the water where later appear the white and green fringed orchids. Sometimes as many as a dozen flowers are borne on one stem, which usually is about sixteen inches in height. Their construction is so marked that little description is necessary, save to say that the fringed lip seems almost to turn upward, the sepals and petals being about equal.

Another interesting flower is the Wood Betony, *Pedicularis Canadensis*, its uneven red

MOCCASIN FLOWER.

and yellow flowers easily serving to identify it as one of the *Schophulariaceæ* or Figworts. The Wood Betony, as its name suggests, is found in damp, shady places growing with Jack-in-the-pulpit, Star-flower and Cinnamon Fern. The short spikes are formed of many small flowers, consisting each of a calyx in one piece, split in front, and corolla two-lipped, the upper narrow and arched, the lower three-lobed. There are four stamens and one pistil. The plant grows about twelve inches high, bearing deeply incised leaves. Coming, now, to the swamps, we are sure of finding great clumps of the Marsh Marigold, and our trouble in obtaining them is fully repaid, since aside from their cheerful beauty, they last most satisfactorily in the house.

When the Marsh Marigolds have faded, we may look for the orchis, *Arethusa*, more rare than the Cypripediums and considered by

some, much more beautiful. The flowers appear singly, on a stem from six to eight inches high, bracted and bearing a many-veined leaf which does not disclose itself until after the flower has perished. The flower is about one inch long; in color, a dull magenta with the protruding lip heavily bearded and crested with yellow and white. It grows in wet, shady situations, often dangerously near the Poison Sumac.

The Arethusa is particularly interesting as being the sole representative, in this country, of its genus, only two known varieties existing, the one here, *Arethusa bulbosa*, and the other a native of Japan.

Our early summer wild flowers are indeed too numerous to permit of mention, but let it suffice if these few lines have drawn attention to some of the most beautiful, and caused them to be more readily known and discovered by those lovers of nature who seek them in their quiet haunts.

BOTANICAL CALENDAR.

Moccasin Flower, *Cypripedium acaule*, *Orchidaceæ;* pink; May 15th to June; dry, occasionally damp oak woods.

Lupine, *Lupinus perennis*, *Papilionaceæ;* blue and white; May and June; in dry, sandy soil.

Wood Betony, *Pedicularis Canadensis*, *Scrophulariaceæ;* red and yellow; May and June; damp woods.

Jack-in-the-pulpit, *Arisæma triphyllum*, *Araceæ;* green and purple; May and June; moist thickets.

False Lily-of-the-Valley, *Unifolium Canadense*, *Convallariaceæ;* white; May and June; damp or dry woods and thickets.

Bird's-foot Violet, *Viola pedata*, *Violaceæ;* lavender; May and June; pine barrens.

Sessile-leaved Bellwort, *Uvularia sessilifolia*, *Melanthaceæ;* whitish; April, May and June; damp thickets.

Arethusa, *Arethusa bulbosa*, *Orchidaceæ;* pink; last of May and June; damp thickets or bogs.

Larger Blue Flag, *Iris versicolor*, *Iridaceæ;* purple; May, June and July; salt or fresh marshes.

Slender Blue Flag, *Iris prismatica*, *Iridaceæ;* blue; May and June; wet ground.

Wild Pink, *Silene Caroliniana*, *Caryophyllaceæ;* pink; May, June and July; woods.

Viola Atlantica, *Violaceæ;* pink; May and June; sunny, dry soil; (Coast Violet.)

White Violet, *Viola lanceolata*, *Violaceæ;* white; May and June; marshes and meadows.

Robin's Plantain, *Erigeron bellidifolius*, *Compositæ;* blue; May and June; woods or fields.

BOOKS RECOMMENDED TO BEGINNERS.

"How to Know the Wild Flowers," by Mrs. Wm. Starr Dana.

"Flowers of Field, Hill and Swamp," by Caroline A. Creevey.

"Flora of North Eastern America," Britton & Brown.

"Newhalls' Trees of N. Eastern America."

"Newhalls' Shrubs of N. Eastern America."

"Our Native Ferns and the Allies." Underwood.

"Natural History of Plants," from the German of Anton Kerner von Marilaun, by W. F. Oliver.

AUGUSTA SCHENCK KALBFLEISCH.

Babylon, L. I.

ERYTHRONIUM, DOG'S-TOOTH VIOLET.—Dr. Gray mentions *Erythronium Americanum* and *E. albidum* as the two species in the eastern country, with *E. bracteatum* as an accidental state of the first mentioned, and the *E. grandiflorum* of the West. These two latter have yellow flowers. The *E. albidum*, White Dog's-Tooth Violet, he describes, "perianth bluish-white," "leaves less or not at all spotted." The plant we have here has leaves very much spotted or marbled with brownish-purple, and the blotches are very large, although there are some plants whose leaves are plain green without spots. These latter are only variations, for they are found intermingled with plants of the blotched varieties. They all produce a large flower of the same size and color. The perianth is about 1½ inches in length; and the three outer sepals are brownish-green near the base, shading off into purple, and a pale red towards the apex. The sepals are reflexed and the style, though fine and thread-like near the germen, gradually increases in size to the apex, bearing three spreading stigmas. The inner side of the flower is white as well as the ends of the lobes on the outside. It would be called a white bloom, and there is nothing like blue about it. There is a groove in the middle of the inner sepals, but no tooth or bract. This plant is satisfied with one single blossom and seems to take turns with other plants in blooming, owing, possibly, to its numerous seeds in the pods, and every seed seems to grow, judging from the immense beds of it, wherever found, growing so thickly together most of the plants do not bloom. The bloomers are those on the outer edges where they have more room to increase and multiply. F. K. STEELE.

Festus, Jefferson Co., Mo.

ODOR IN THE PURPLE MOCCASIN FLOWER.—In collecting this pretty orchid (*Cypripedium acaule*,) I have more than once noticed a delicate, sweet perfume exhaled by the fresh flowers. This season, on bringing some of the plants into the house, I was surprised to find that not only the flower but the whole plant was thus odorous. The short hairs with which the leaves are thickly covered are tipped with tiny glands, giving to the leaves a clammy feel, and I have thought that the nectar-like perfume might be traceable to that source. It would be interesting to know if others than myself have had a similar experience with this species.

Another point that interested me in the plant I brought indoors was the change from bud to flower. The bud showed plainly the form of the curious lip, but half size and almost white. Over night it grew perceptibly, and in thirty-six hours, was full size and blushing rosy purple. Now, where did that color come from? C. F. SAUNDERS.

Philadelphia.

FRUITING OF OAKS.—It is not generally known to the average lover of trees, though botanists are well acquainted with the fact, that some oaks take over a year to mature the acorns. The little flower in the axils of the leaves, when the new growth is just starting, receives the pollen from the long, twine-like catkins that hang like tassels all over the branches, and then go to rest for the season. The next year when the new flowers are going through the same process, the little germs fertilized the season before, take on renewed activity and by the fall of this second season are mature acorns. Only the section classed as white oaks go through the whole process from fertilization to maturity the same season. Of those that are native to the Atlantic States are *Quercus alba*, *Q. obtusiloba*, *Q. macrocarpa*, *Q. bicolor*, *Q. Prinus*, *Q. Prinus pumila*, and the Live Oak, *Quercus virens*. All the other species take two seasons to perfect their acorns. In some seasons, the male flowers, which are more susceptible to heat than the females, come to a polleniferous stage before the fruit-bearing flowers have advanced sufficiently to profit by the pollen. In these cases the crop of acorns fails for a season. And this is true of all amentaceous plants. A crop of nuts of any kind is dependent on the period of maturity of the catkins. In the more northern regions, where there are but few extra warm days in the winter season, the nut crop is more uniform in successive years.

A CLIMBING FERN.—In a letter to the Senior Conductor, a South Carolinian correspondent says: "I know you have traveled and collected in our North Carolina and South Carolina Mountains, and I want information from you of a climbing fern—some *wise* body here calls it Hartford Climbing Fern (which I am quite familiar with),—but describes to me a plant I fully believe to be a climbing asparagus." It is "filmy and lace-like, and grows from 4 to 7 and 10 feet high, with *no* leaves,—but delicate as *mist*, with branches; over 18 inches wide at base." Long ago, a botanist from Rugby, England, discovered this plant *here*, and said, to the lady who saw him gather it, 'this is the rarest fern known on earth, and, so far as I am informed, it grows in only one spot on earth, —here.' Now, can you tell me what this find is? Of course, I know Hartford Fern well, but it has *no* branches, nor are its fronds branching; but has long, slender-stems, with opposite or alternate, trifoliate leaves."

This cannot be recognized from the description, and a specimen would be thankfully received.

DROPSICAL STEMS.—Mr. W. C. Egan sends a specimen of *Pentstemon lævigatus*, which we can best describe as being afflicted with dropsy. The middle of the stem, usually the size of a straw, is as large as a cigar, and twisted as a well-made cigar might be. It illustrates the spiral growth of plants, which cannot be well traced in the normal condition. Students ask why growth is spiral instead of direct,—the answer is that under dynamical laws, they have to grow in that manner.

GENERAL GARDENING.

SWEET PEAS.

What gracious thoughts hath God, and beautiful!
The elder drifted by still meadow ways,
The rippling wheat fields of these summer days,
Whereover float far clouds like new-washed wool:
The glow of sunset, and the after lull
When white stars tremble thro' the twilight haze,
And, weaving webs of fiery-golden rays,
The fireflies glitter in the shadows dull.
His thoughts are very beautiful, ah, yes,
In rose and lily, and in bright heartsease;
In these, no less, is seen His loveliness,
These fragile shells, delightful mysteries,
Sweet miracles that so their Lord confess
Who giveth us Himself, anew, in these.

—INGRAM CROCKETT.

Henderson, Ky.

PRUNING VINES IN SUMMER.—The chief art in gardening consists in not allowing our plants to have their own wilful way, but to make them behave as we want them to do. Vines, generally, make desperate attempts to get to the top of a bush or tree that they twine around, and the lower portion is nothing but a series of naked stems. When we set them to trellises, we want this proceeding reversed. We desire as many branches close to the ground as at the extreme upper portion of the pole or frame on which they are supported. The educated gardener understands how to do this. The grower of grapes under glass has to know how to do it as otherwise he would have grapes in the apex of the roof and nowhere else. He applies the same principle to the growth of flowering vines out of doors as to his grapes under glass, or to the grapes in the out-door garden, for that matter, with equal results. Indeed, there could be few better methods of learning whether one has a real gardener or only a wolf in sheep's clothing, than by noting whether he allows the honeysuckles to grow in crow's nests under the coping of the piazza front, or whether the branches are of equal strength from apex to the ground.

And yet, the art is very simple. It is simply to pinch out the apex of the strong growing shoots that want to get up still higher, and leave the struggling shoots at the base alone. The growth force, suddenly checked by the topping of the upper shoots, has to be expended somewhere, just as the sudden stoppage of water being forced through a pipe may burst that pipe. It is diverted to the lower and weaker shoots, which become, before the season is over, as strong as the upper ones.

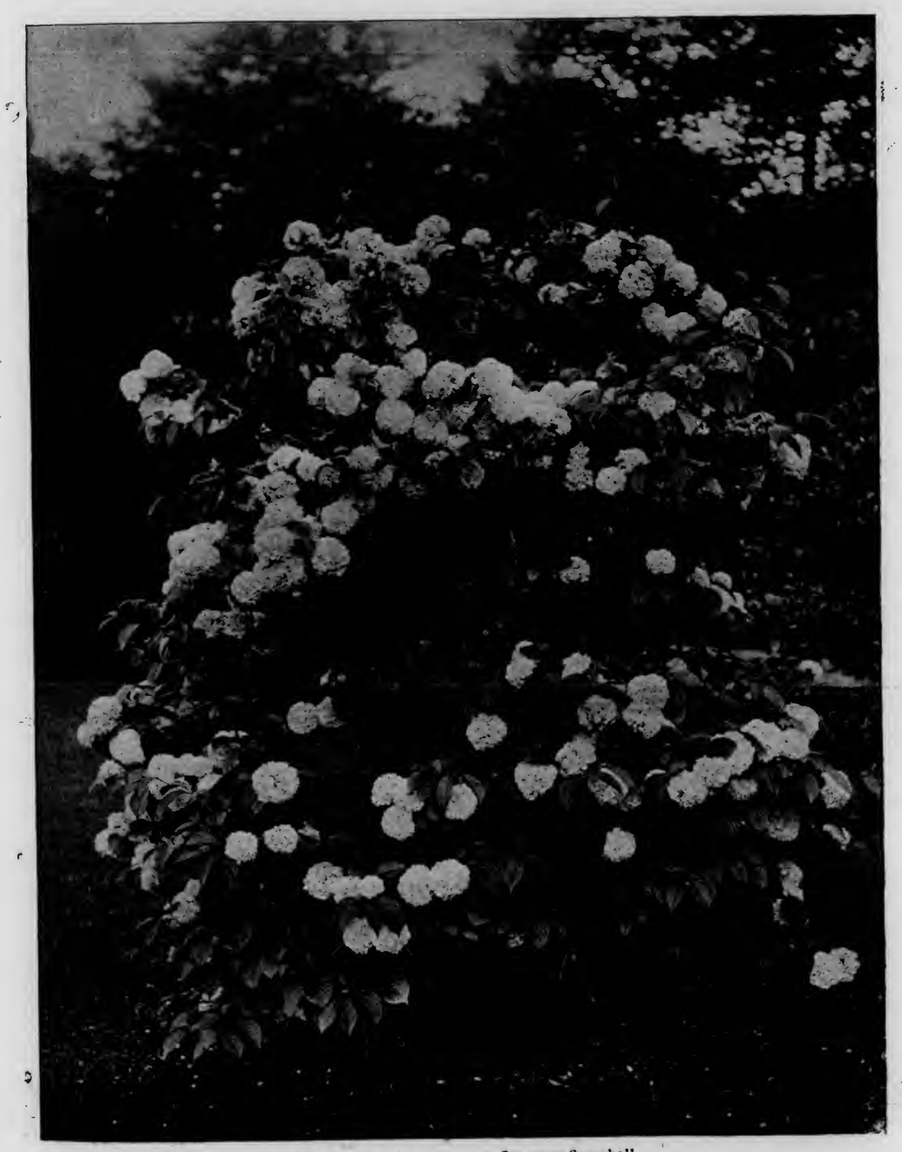
In the hands of a good gardener, a grape vine trellis will have fruit over every part of its surface,—and have as fine fruits at the apex as at the base. But how rarely do we see these masters of the art; and how simple the art is, after all!

WILD GARLIC.—Among all weeds, those which simply make bulbs or bulblets are readily eradicated. One of the easiest is the wild garlic, *Allium vineale*. The green leaves appear early in spring, and a boy or cheap labor of any kind with a three-tined handfork can lift them out without leaving a particle to make a new start. It does not take long to clear an acre of ground unless they are extremely abundant. In the latter, they can be worried very much by the hand or horse cultivator during the growing season, and then to have the hand-lifting in the following spring. Possibly a few may appear the following spring, but their accounts are easily settled, by the same hand-lifting process.

WATERING GRASS IN SUNSHINE.—It is a well worn fallacy that lawns should not be watered while the sun shines. Perhaps the only gain from this statement is to the owners of the water supply, as there will be less waste from sprinklers going all day long. Where deemed necessary, the water may be used in unlimited quantity in full sun-light so far as danger from the latter source is concerned. Some heavy, poorly-drained soils will not stand too much water, and this should be considered.

VIBURNUM PLICATUM.—The following account of the above "bush" is taken from "The Ornamental Flower Garden," by Lindley and Sweet, published in London, 1854.

"Mr. Fortune, who procured this among many other fine plants for the Horticultural Society, says that it is a 'native of the Northern part of the Chinese Empire, and was found cultivated in the gardens of the rich, by whom it was much admired. It will doubtless prove



VIBURNUM PLICATUM.—Japanese Snowball.

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VIBURNUM PLICATUM.—Japanese Snowball.

INTENTIONAL SECOND EXPOSURE

perfectly hardy in England; and on account of its neat habit, will probably become a great favorite in our gardens.' "

"Siebold and Zuccarini, speak of it as one of the most beautiful plants that are cultivated in Japan. Its name, Salsuma Temari, indicates that it inhabits the most southern province of Kinsia; it was probably in the beginning imported from China * * * * * but it only grows from four to ten feet high."

I have plants that are ten and twelve feet high. It is one of the most valuable shrubs in cultivation. Perfectly hardy; foliage most pleasing. When in bloom, very beautiful. As yet no insects or disease has attacked my plants. Why was it so long in coming into general cultivation? H. HEATON.

Amherst, Mass.

TREATMENT OF BULBS.—It is a well-known fact that bulbs, brought from Holland and forced in our country, are comparatively useless for flowers the season following. This is really owing to the fact that the leaves have not been permitted to mature properly. A bulb is composed of the bases of leaves which have become thickened and succulent. To make good, strong bulbs, therefore, it is necessary that they should have had good, strong leaves for their parents. Our bulb growers commence to dry them off almost at once after flowering, instead of allowing them to grow as long as possible. Even then, they will not flower as freely as newly imported bulbs, because they are only allowed to flower until the bulb has reached a size desired by the grower. Bulbs generally have the flowers plucked out, until they have reached the size desired.

HARDINESS OF DEODAR AND OTHER CEDARS.—Enquiries are frequently made as to the hardiness of the Deodar Cedar. In the vicinity of Philadelphia it appears to be entirely hardy so far as its wood is concerned, but it rarely carries its foliage through the winter without injury. There is enough harm to the leaves that as soon as the sap moves in spring they fall off. This cedar is one of the first to make new growth in spring, and is altogether a most desirable evergreen.

Cedrus Atlantica glauca has passed through the last and previous winters unscathed, save that its foliage is partly browned. Its shoots are firm to the top. It is much in the favor of this beautiful evergreen that it is so hardy. When young it makes but few branches, and these are of more than usual length, but as it adds to its years, its branches become more numerous. When of fair size, because of its silvery foliage, it is very attractive.

Strangely enough, the Lebanon Cedar, looked on as the hardiest of all, which it usually is, had its wood hurt more than either of the others in the past winter. It carried its foliage better, but some of the latest growth was killed back here and there.

All three may be considered hardy in this vicinity, and the Lebanon and *Atlantica glauca* are known to do well even further north.

J. M.

PROTECTING TREES FROM CATERPILLARS.—One of the great nuisances, about trees in summer, is the ravages of insects, and to successfully combat them requires careful and vigorous action. A quite common method is to wrap a band of cotton around the trunk saturated with some liquid obnoxious to the class of insects that crawl up the trunk; but perhaps better is the more modern preparations, such as Caterpillar Lime, which being thick and sticky, are almost positive barriers if put on thoroughly. The preparation should be at least ¼ inch thick on the tree and in a band 5 or 6 inches wide.

AMERICAN FORESTRY.—A Philadelphia correspondent states that in view of the evident scarcity of timber in a few years, he is inclined to go into planting trees on an extensive scale as a nest egg for an income in his old age, and desires to know where he can obtain information on the art of American Forestry. So far as MEEHANS' MONTHLY understands the situation, American Forestry has not reached the position of an art. All that has been done so far is the creation of a public sentiment in favor of protecting the native forests, and for the general planting of trees. But how to plant for profit, or how to get the most timber out of trees in the shortest time, has not been studied. Indeed, the whole subject of reducing American Forestry to an art is surrounded by great difficulties. For instance, suppose we select a piece of ground and decide on the tree

best suited to the soil and conditions, no one could tell certainly how wide apart to plant them. If too wide, they would make strong side branches, and not have the long trunks so desirable. Hand-pruning, to get tall trunks, would hardly be profitable. The trimmings would have to be removed, or dead brush would surely end in a forest fire. The trees could be planted but four or six feet apart. In this state, the side branches would be killed as the trees grew and no hand pruning would be needed. The stronger ones would towards the end kill out the weaker ones,—but again we have a mass of dead material to encourage the forest fire. It is in these lines that forestry, as an art, comes into existence. So far it has not shown life.

DANDELIONS ON THE LAWN.—To many persons, the sight of the pretty, golden dandelion blossoms amongst the grass on a lawn is a pleasing sight, while to others it is a nuisance. If kept in check and not permitted to seed, they can certainly be called attractive.

If the lawn be mowed constantly, as it should be, and occasionally weeded, intruders of this kind will hardly be ill-considered.

FORMING LOW-BRANCHED TREES.—Some fast growing trees get finally too tall for the purposes for which they were originally planted. Through the winter season, when employment for what are popularly known as tree butchers is scarce, the axe and saw are vigorously plied to head back these trees. It is thought this is the proper method to make the trees throw out wide-spreading branches. Any careful observer may see that this is never accomplished. The butchered tree only endeavors to go up more rapidly than before. If this topping business were to be done late in spring, or in early summer, when the tree is in mature leaf, and starting to grow vigorously, the effect would be very different. The growth-force is not sleeping at that period as it is in the winter season; but in active operation. The force intended to be expended in the upward growth must exhaust itself somewhere. Suddenly checked in its upward course, it is diverted into the lateral branches, which are strengthened accordingly. The care taker of hedges, or, as they have come to be termed with us, live fences, understands this very well. He cuts back the strong shoots at the apex severely, and thus manages to have the hedge as thick at the bottom as at the top.

Unfortunately, the tree-butcher is usually at his day's work in the summer time. It is only under the starvation stress of the winter season that he whispers in the owner's ear, that his trees need pruning.

VITEX AGNUS-CASTUS.—It seems to me that this shrub does not receive as much appreciation as it ought to, perhaps from the fact that it has not been considered hardy in this latitude. A large clump of it was a very pretty sight in one of our shrubbery beds last season. The pale blue panicles of flowers make a beautiful showing above the pretty, divided leaves. JOHN W. DUNCAN.

Greenwich, Conn.

NEW OR RARE PLANTS.

NEW ASTER, HOHENZOLLERN.—The new aster, Hohenzollern, is considered by Mr. Henry F. Michell as his best introduction for 1899. It is claimed to be the largest yet introduced, and pure white.

ULMUS SEROTINA,—A NEW ELM.—In a list of newly-discovered American trees, chiefly palms, recently described by Prof. Sargent, in the *Botanical Gazette*, is an elm, which he terms *Ulmus serotina*. It is one of the autumnal flowering section, first collected by Rugel on the French Broad River, in 1842, and again by Dr. A. Gattinger, near Nashville, in 1879, but who supposed it was *Ulmus racemosa*. It is a tree about 40 or 50 feet high, and 2 to 3 feet in diameter, and there are some in Huntsville and Rome that have been planted as shade trees.

BRANCHING TULIPS.—For several seasons, I have had a double, early tulip that bears bulbs in the axils of the lowest leaves, and flower stems in axils of upper leaves. There are usually three branches, but once I found five. I paid but little attention to the plants, as the flowers on these additional stems were not fully developed until last year, when the oldest bulb produced a plant having three branches, and the terminal stem, even, bearing well developed flowers. Among my single, late tulips, I found one that branched differently, the branches being divisions of the main stem;

the flowers all the same size. One plant had two—another three flowers. I never heard of branching tulips, but do not consider the first is a real freak, for it is natural for plants to "branch" in that way.

Fritillaria pudica, one of our wild flowers, has quite often the stem divided so that there are two or more flowers instead of only one.

The habit seems to be transmitted indefinitely, as I have had them continue to bear double stems for years. SUSAN TUCKER.

Cheney, Washington.

THE HARDY FLOWER GARDEN.

THE JAPANESE IRIS.—The Japanese Iris is probably well-known to admirers of Japan paintings of landscapes, as it seems to be a favorite element in pictures of garden scenery. During recent years, it has found a place in the affections of American flower lovers,—and the demand for it is very great. During a visit made by the writer to Mr. H. A. Dreer's establishment, at Riverton, New Jersey, one of the striking features was an immense area devoted to this Iris. A "snap-shot" taken in passing, and reproduced here, may give a slight idea of the unique scene.

JAPANESE IRIS.

MIELLEZ'S "REVELATION" LILY-OF-THE-VALLEY.—The Lily-of-the-valley is a plant in which one hardly looks for improvement, yet several promising varieties are in cultivation to a small extent. Miellez's Revelation is a variety bearing the recommendation of Mr. Edw. Gillett, Southwick, Mass., who says:

"It is of extraordinary size and vigor, of the most exquisite fragrance, and does well under all conditions and all sorts of soils, growing just as well in full sun as partial shade and is extremely hardy, and while not increasing quite as fast as the common kinds is still of good increase. It is well to cover it in December with a good coat of barnyard manure—cow or horse—green is just as good as old. Leave it in the spring to serve as mulch."

NATIVE BULBS FOR THE GARDEN.—It is frequently the case that in planning gardens, pure nature is in a great measure overlooked. Catalogues are crammed with novelties and varieties, most of which are doubtless worthy of a place, but yet which should not claim undivided attention.

The surroundings of a home should be made lovely and attractive to those who dwell there. If there be paths designed for comforting strolls, every step should be pleasing. A charming custom is that of planting snowdrops and crocuses singly and scattered through the grass of a lawn, from which they peep in early spring. It should not be regularly planted like a calico print, but scattered in natural profusion.

In the writer's neighborhood, the chief delight of children—and of many grown persons, too—is to "go for" violets, or blue-bells, buttercups, daisies or "Day-wakers" (more generally termed Stars of Bethlehem—botanically, *Ornithogalum umbellatum*). The gathering does not end the pleasure, for it is pleasant for others to watch the interest which the young folks take in nature's gifts; and these flowers, for many weeks, brighten and cheer up a great number of homes.

These flowers will yield almost as much pleasure if arranged on the home grounds in a natural way. Blue-bottles (*Muscari*) and ornithogalums might be scattered through the shrubbery borders very acceptably. Bare soil may be kept to look neat, but otherwise there is no attraction. They cannot be planted in the lawn, as their rapid increase may prove noxious; but anywhere that they may easily be kept in bondage, they will give pleasure.

The writer has seen whole pastures a mass of white with the flowers of the ornithogalum, and a prettier sight (to any one but the farmer, although cattle will eat them) can hardly be imagined.

FRUITS AND VEGETABLES.

OLD AND GOOD VARIETIES OF FRUIT.—Is there an apple better than a Gravenstein? A pear better than a Sheldon? or a grape than the old and now neglected Isabella?

Two vines of this grape, at my old home in Wyoming Co., N. Y., never failed to give us a good crop—some years not so heavy, but enough. The vines had no pruning except in an occasional year, when they got too rampant—except the dead branches. It was manured every fall. Posts were driven into the ground and wire strung across was the support.

It was very seldom they did not ripen perfectly; and such delicious grapes! I remember one fall we had so many that we packed ten bushels of clusters in oats in a bin in the cellar, and we had grapes into February. How sweet they were! and rich in flavor! It is rarely I see this old grape mentioned in the list of grapes. Why is it? MRS. FREDERICK C. JOHNSON.

Conklin, N. Y.

The Isabella was one of the first of the older varieties of grape to succumb to the attacks of the root-gall aphis—Phylloxera. Where it continues free from these attacks, it, with its sister Catawba, is scarcely excelled by the newer varieties.

ORNAMENTAL PEPPERS, — THE MIKADO.—The useful and the beautiful are not always combined in vegetables, but they are not the less welcome when they are. The pepper family, as the various forms of *Capsicum* are termed, is of the combined class. Mr. Burpee is sending out a variety he calls Mikado. It is flat on the upper surface, and four of the five lobes would represent a Maltese cross. From the name, it might be thought to be a variety of the Asiatic *Capsicum Chinense*, but on this we are not informed.

POMELO, *versus* GRAPE-FRUIT.—In the March issue of MEEHANS' MONTHLY, there was a beautiful picture of a portion of a Pomelo tree, with the large fruits hanging upon the pendent branches. Of all the citrus fruit, there is none that makes a more beautiful showing on the tree than the Pomelo. Its size is more than three times that of the orange, and its clear lemon-yellow shines against the background of dark green foliage. The taste is delicious when one understands how to eat this fruit. The rind is bitter, and should never come in

MIKADO PEPPER.

contact with the mouth,—nor should the inside skin and septiments. The proper way to eat a Pomelo is to cut it through crosswise of the axis, and, with a spoon, dip out the juice. Some prefer a sprinkling of sugar over the cut surface before eating.

But the name Pomelo is that which should be used instead of the ridiculous and absurd title Grape-fruit. There is no sensible reason why the former should not be used under all circumstances. It is the name by which it is called in its East Indian home, with such slight variations as "pummelo," "pomelow," etc. It is short, simple, euphonic and historic. There is no remote resemblance in either tree or fruit to the grape, but the pomological sin committed by some one in Florida, who started the name Grape-fruit, has descended to the present day. Let us not perpetuate and propagate it. Talk, write and eat Pomelos, and enjoy one of the best and most wholesome things of life. H. E. VANDEMAN.

April 11th, 1899.

BIOGRAPHY AND LITERATURE.

THE HUMBLE-BEE.

Aught unsavory or unclean
Hath my insect never seen;
But violets and bilberry bells,
Maple sap and daffodils,
Grass with green flag half-mast high,
Succory to match the sky,
Columbine with horn of honey,
Scented fern and agrimony,
Clover, catchfly, adder's tongue
And brier roses, dwelt among;
All beside was unknown waste,
All was picture as he passed.

Wiser far than human seer.
Yellow-breeched philosopher!
Seeing only what is fair,
Sipping only what is sweet,
Thou dost mock at fate and care,
Leave the chaff and take the wheat.

—EMERSON.

DR. A. W. CHAPMAN.—The able and well-known botanist, Dr. A. W. Chapman, author of the "Flora of the Southern United States," which has passed through several editions, died at his home in Apalachicola, Florida, on April the 6th, nearly reaching his ninetieth birth-day. One of the greatest of American botanists, he was of remarkably modest and retiring habits, but he will be long remembered for his eminently useful life.

JAMES M. THORBURN.—Few names connected with gardening have been more widely known than that of J. M. Thorburn, of New York, the grandson of Grant Thorburn, the founder, over three-quarters of a century ago, of the famous seed-house. His death occurred in New York, on the 24th of April. He was in his 79th year. He was a gentleman of remarkably modest and retiring disposition,—and yet sound and progressive in every line.

EDWARD A. ROGERS.—The introduction of Rogers' hybrid grapes marked a new era in American grape culture. The death of the originator, Mr. Edward A. Rogers, of Salem, Mass., hast just been announced. This occurred at Peabody, Mass., on the 30th of March. It is remarkable, considering the grand results of Mr. Rogers' experiments, that more work in the same line has not been attempted. All he did was to plant under a hot-bed frame a vine of the European race, and one of the American Fox grapes. They then hybridized, naturally, as one might say, as the results proved. If the path marked out by Mr. Rogers had been followed further, valuable results might have rewarded the explorer.

MR. CHARLES NAUDIN.—Charles Naudin, a French botanist equally famous in horticultural circles, died at Villa Church, at Antibes, on the 19th of March, in his 84th year. He was then occupying the position of Director of the Experiment Garden there. His "Amateur Garden" and "Treatise on Horticulture" are among the ablest books on French gardening. There have been few abler laborers in the science and art of horticulture during the present century,—and he passes away carrying the love and admiration of garden lovers over the wide world.

THE EVOLUTION OF PLANTS,—By Douglas Houghton Campbell, New York. Published by The MacMillan Company.—Few topics have met with more wide-spread interest than the evolution of plants and animals. That numberless forms of organic being that now exist had no place on the earth at one time,—and that a large number that once existed exist no longer, is an established fact. In what manner these appeared and disappeared,—and especially where, when and how the human race did appear, are, to use a common expression, burning questions.

Examining plants, as they are to-day, we find some, as in bacteria, merely single cells,—others with compound cells, others with a continuous addition of cells, and these cells finally taking on numberless forms, and with many special functions, and all these can be traced, as so many successive links in a chain, from an oak or a palm, down to a moss or simple bacterial cell. It would certainly seem as if,

in some way, that which is worked out on such a plan, must have had a unity of origin. The grand palace must surely have had a beginning in the original brick.

While this must be true, the manner in which it has been all brought about is the popular question. Darwin and his followers contend that plants and animals are liable to accidental variations and that when these variations come at a time when the plant has a struggle for existence, the plant or plants that can turn this accident into practical use against its enemies, triumphs over the rest,—and thus a new race comes in at the expense of the old. The accidental variation becomes hereditary, and we have the new species. This is the essence of the Darwinian doctrine, and seems plausible, especially when brightened by the brilliant platitudes of Grant Allen, and writers of the sensational class.

These views are all presented in a remarkably clear light in this work by Dr. Campbell. It is in a clear and popular style. Any intelligent person will enjoy it without the need of a Greek or Latin dictionary at the elbow. Even those who believe they know what evolution means, will derive pleasure and profit from a perusal of this succint history; and this may be said in spite of the fact that later views of the theory of evolution seem to show, that while the views of Darwin and Grant Allen have a foundation on a limited number of facts, they are very far from solving the great mystery.

GUIDE TO THE STUDY OF COMMON PLANTS.—An introduction to botany. by Volney M. Spalding, Prof. of Botany in the University of Michigan. Published by D. C. Heath & Co., Boston, Mass.

Botany, as taught in schools in general, in the last generation, was rather a dry study. It had to be gone through with as one of the courses, but in the old book stores, near the colleges, the text books may be found in great numbers, which the students were glad to dispose of, as soon as the graduation papers were signed. It has been a wonder that some of these were not selected by the graduates for burning on the festivities of their college endings, instead of Xenophon, for botany must, after all, be nothing but "Greek" to them.

But it has become popular. The Public Schools especially, with their "nature studies," which consist chiefly in observing, comparing and judging of any natural object brought before them, have done wonders in popularizing a love of plants and flowers as the leading object of interest in nature. The mere collecting of plants and making herbariums, without the subsequent study of the material, is of no more service than making a collection of buttons. Now it is the fashion to look more into their nature, their history, and to listen to the many stories of the present and the past that they are fond of whispering to those who love them.

How this popular treatment of the formerly abstruse science is advancing, the number of books appearing on the subject will show. This "Introduction to Botany," by Prof. Spalding, is the newest addition to the useful list. It is prepared in the form of exercises for pupils, with suggestions to teachers for guiding the students in their studies. It deals chiefly with the subjects that are commonly before the eyes of people generally, and treats the topics in popular language; but refers, in foot-notes, to those works wherein the advanced student may pursue the more learned details.

SHAMROCK.—Some say the original Shamrock was the White Clover; some the Wood-sorrel, or oxalis: some the Dutch Clover; some the Medick or Black Nonesuch; some the Buck-bean; some the Water-cress. It is curious that Arabs have a trefoil called Shamrock.

George Wither, in his "Abuses Stript and Whipt," speaks of the Irish people as eaters of "Shamrootes." Is not the Shamrock, here referred to, the water-cress? I find record of it as being so named. C. W. G.

THE GOLDEN-ROD AS THE NATIONAL FLOWER.—A correspondent says: "I regret that you, in your article on *Solidago*, did not advert incidentally to the proposal to make it the national flower—to which place its claims are very strong. Some plants have been suggested that are absurd—*Nymphæa*—very pretty, but not found in California, I think. It wilts in a few minutes after it is taken out of the water—a fatal defect. The national emblem must hold up its head.

Epigæa is too scarce—and, in a sense, local. It is found in the mountains in the South, but

not generally there, I think. *Solidago*—Europe has but one species, while we have nearly a hundred. It grows all over the country abundantly—coloring our Autumn landscape yellow as the gorse colors England. It is showy, and some species are fragrant. It holds up its head well. Abundance is a vital quality. The original Shamrock, *Oxalis Acetosella*, is now exterminated in Ireland. They use *Trifolium repens*—white clover—instead. These qualities constitute a stronger claim than can be made for any other plant. *Zea Mays*, the Indian corn, has also been named. To suggest a corn stalk as a button hole flower is enough to kill it.

HISTORY OF JOHN BARTRAM.—In the past ages, when any one became famous, it was too often the practice to collect the most improbable gossip, and give it out as veritable history. The "letter of a Russian gentleman" in relation to a visit to John Bartram, bears intrinsic evidence of its fictitious character,—and yet it is used continually in biographies of the old botanist as veritable truth. He is described therein as an ignoramus, but resting for a few moments from the hard work of ploughing a field one hot summer day, he was struck by the beauty of an Ox-eye Daisy he had turned down, and determined from that day to know something more about nature around him. He bought a botany book, and from this day his life as a botanist began. The exact story is not before the writer while penning these lines, but this is the substance. In contrast with this is an account of the gardens by his son, written in 1801, which says:—

"Kingsess gardens were begun about the year 1720, by John Bartram the elder, at a time when there were no establishments of this nature in Pennsylvania, if in any of the colonies, unless we may except that of Dr. Clayton, in Virginia, which though inferior in extent, was furnished with a considerable variety. They are situated on the west bank of the Schuylkill, four miles from Philadelphia, and contain about eight acres of land. * * The worthy founder of these gardens, discovered in his early youth, a love for philosophy and natural history in general. He was, however, particularly drawn to the study of botany from considering the importance of vegetables in the practice of medicine, and their indispensable use in various departments of human economy. * * * In this condition it descended to his son, whose care it has been to preserve its well earned fame. * * "

It is further well known, that he took a course in medicine, before deciding to devote himself to botany only. He was anything else than an unlearned farmer, as the biographies would have us believe.

FOX-GLOVE.—In the April number of the MONTHLY (page 63), you endeavor to give the derivation and meaning of Fox-Glove, and further to elucidate the subject, I will quote from the *American Encyclopœdic Dictionary: Fox-glove, Folks-glove* (*Folks* as *foks*.) English Fox and Glove; Anglo Saxon *Foxes glofa*. Or folks and glove—fairies' glove. So fairies, folks (foks) came to be fox, which is evident from the lines of W. Browne:

"To keep her slender fingers from the sun,
Pan through the pastures oftentimes hath run
To pluck the speckled Fox-glove from the stem,
And on those fingers neatly placed them."

In the German *Digitalis*, from the Latin *Digitale*, a thimble, is *purpur-rother Finger-hut;* that is purple thimble, and as thimbles are protection for fingers, it is not unnatural to a change into glove."

In all European languages, as far as I have been able to examine, the common name of *Digitalis* is either a glove or a thimble. In Spanish it is *dedalera*, from *dedal* a thimble, and in French, *Gant de Notre-Dame*, "Our Lady's Glove."

C. L. LOCHMAN.
Bethlehem, Pa.

The reason for offering the suggestion in the April number, that Fox-glove originally meant "imitation bells" or "false bells," was that the explanation of the encyclopœdias and dictionaries is unsatisfactory to most scholars in philology. An imitation thimble—false-thimble—would not be so far-fetched as "false glove."

THE SASSAFRAS.—The *American Druggist* tells us that soon after the American continent was discovered, there was a belief that wonderful virtues resided in the Sassafras, and ships were sent from the Old World especially for the wood and root. All sorts of virtues were attributed to it,—even to a belief that it would make salt water drinkable. Though it lost its wonderful reputation, it is still used to a considerable extent in pharmacy.

BIDENS CONNATA

BIDENS CONNATA.

CONNATE BUR-MARIGOLD.

NATURAL ORDER, COMPOSITÆ.

BIDENS CONNATA, Willdenow.—Glabrous, a foot or two high, loosely branched, leaves either all undivided, oblong or broadly lanceolate, acuminate at both ends, sharply serrate, tapering into margined petioles or the upper sessile; or some with a pair of lateral divisions which are sessile and decurrent on the petiole. Akenes oblong-cuneate or the outermost obovate, nearly glabrous but retrorsely hispid-ciliate, commonly three-awned. Gray's *Synoptical Flora of North America*. See also Gray's *Manual of the Botany of the Northern United States*, Chapman's *Flora of the Southern United States*, Wood's *Class-Book of Botany*, and Britton and Brown's *Illustrated Flora*.

At the first sight of our picture, the reader might believe he was introduced to a familiar weed, having in mind the common "stick-tight" of cultivated ground, the seeds of which, when attached to the clothing of some hapless trespasser on what the plant regards as its own domain, fully justifies the familiar name. That species is *Bidens frondosa*, a close relative of the one here illustrated, but which never or rarely becomes a weed, as *Bidens frondosa* does. Many years ago, the author suggested that a weed could only be defined as a plant growing where the cultivator did not want it, and there is probably no better definition to-day. *Bidens connata* grows in waste places, but seldom trespasses on the cultivator's ground. Occasionally, where a crop of corn has been carried too near a swamp or a water-course to be of much value to its owner, the plant will stray a little over the borders to which nature had assigned it. If one had not some pre-conceived idea of weediness, a first view of our drawing would convey an idea of elegance few flowers could afford. The slender pedicels are somewhat stiff, and this is in strict harmony with globose heads; but this stiffness is admirably relieved by the general arrangement of the whole mass of inflorescence. Even in the coloring, the rosy tinge of the petioles and adjacent portions of the stem brightens up the whole picture. Beauty does not consist of a mere glare of coloring, but in harmonious combinations such as this species in our drawing happily presents.

In American autumnal scenery, it is one of the elements that often give unbounded pleasure to river scenery. Near the mouths of some of our large streams, there are often areas of flat land subject to occasional overflows, and on the newly-deposited soil, our plant and a score or two of others grow to rank perfection. During August and September, these plants together often make a picture, once seen is never to be forgotten. What Moore has said of some chance human glance, is just as true of these glances at Flora when in the proper mood.

"Oh! there are looks and tones that dart
An instant sunshine through the heart,
As if the soul that minute caught
Some treasure it through life had sought!"

In the first volume of the *Botanical Gazette*, Professor John M. Coulter describes a scene in September, on the line of the Ohio River, in which our plant is represented, and which must have been very beautiful. It had for companions, besides other species of *Bidens*, richly-tinted Polygonums, Polanisias, large clumps of the purple *Baptisia australis*, the rosy *Hibiscus militaris*, various species of golden-flowered *Helianthus* and *Coreopsis*, with numbers of others which gave beauty of form if not as brilliant in coloring as their neighbors of a gayer mould.

Passing from the aesthetic character to the botanical history of our plant, there is much of interest to the student. The name for the genus, *Bidens*, was given by Tournefort, and adopted by Linnæus. It is a Greek name suggestive of the two teeth-like awns that crown the akenes, though some species, as in the one here illustrated, may have more than two. The student interested in questions of nomenclature, in which the matter of priority comes in, will be puzzled by the figures and dates of different authors. Prof. McMillan tells us that

COLOR PLATE

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COLOR PLATE
INTENTIONAL SECOND EXPOSURE

it is No. 641 of Linnæus' *Genera Plantarum* of 1737; but Dr. Gray gives No. 932. The latter number is employed in the edition of 1767. In the author's copy, issued in 1743, the number is 776. It will be seen that the particular edition of Linnæus will be of importance where the verification is to be traced up. So in relation to the authors themselves. Vaillant gives to this genus the name of *Ceratocephalus* and quotes Decandolle, 1836, as the authority; but this is but a reference, the name having been given in *Acta Gallica*, 1720. This would, therefore, antedate the Linnæan name, if it had been the absolute creation of Linnæus, in 1737, and not of Tournefort, so much earlier. The difficulty the student will find in getting at the exact priority of dates and numbers, is also illustrated by the species. *Bidens connata* is referred to Muhlenberg; but in no work of Muhlenberg is the plant found described. It appears first in De Candolle's *Prodromus*, of 1803, as having been suggested to him by Muhlenberg; but the mere suggestion does not carry with it the right to be quoted as the author, under botanical rules.

The species is a very variable one. Before the extent of variation was known as well as it is now, several species were made out of these variations. The one herewith illustrated is not the form taken in hand by Muhlenberg, when he first proposed the specific name now generally adopted. It is a form which Nuttall regarded as distinct. His specimens are marked *Bidens lanceolata*; but when he described it as a new species, in the Journal of the Academy of Natural Sciences of Philadelphia, it appears as *Bidens petiolata*. There is also little difference in the one illustrated from the form named by Bigelow, in the "Flora of Boston," *Bidens tripartita*, though not the same as the European species of this name as originally determined by Linnæus. *Bidens cernua* seems to have been the first species to be placed under the genus by Linnæus, who noted it in his tour through Lapland. It has a wide distribution through both hemispheres. In many respects, other species show connecting links with it, and if there is truth in the speculation that many species of plants have sprung from progenitors still existing, it would not be difficult to imagine that *Bidens cernua* was the parent of the subject of our present sketch. In connection with *Bidens frondosa*, it forms a section of the genus distinguished by the absence of ray petals, and several other minor characters. It is easily distinguished from *Bidens frondosa*, by the akenes being somewhat triangular and three-awned, as seen in our Fig. 3. One familiar with both species can recognize each by peculiarities of foliage; but the student will have difficulty. Variations are very great. In Minnesota, leaves of some variations are cut into comb-like sections. Its range is given by McMillan as "North America, New Brunswick to Saskatchewan and Nebraska, Illinois, Missouri, Georgia and Texas." It has been found useful in medicine as an expectorant in bronchial troubles.

The family of *Bidens* has managed to make its way widely through the world,—and to a degree that other families might envy; and yet, what is remarkable, the species themselves are in some degree more localized than usual. Outside of the species that are native to North America, three are found in Europe, two in the East Indies, three in China, one in New Zealand, two in Southern Africa, and four in Tropical Africa, five in the Sandwich Islands, and one generally over the East Indies. Scattered over the New World, two are credited to Cuba, two to San Domingo, two to Argentine, one to Paraguay, one to Costa Rico, three to Bolivia, one to Guiana, six to Eucador, two to Guatamela, four to Venezuela, three to Chili, eight to Peru, ten to Brazil, and five to the Pacific Islands. There is, however, one that grows over most of the West Indies, and four South American ones that disdain any special locations. Mexico, however, seems to be the great central family home, there having been no less than twenty-five species described as claimed by that region, and more are continually being found and named by explorers. There are few families of plants that can show a record for localization equal to *Bidens*, and yet have so wide-spread a distribution over the world. Yellow is the prevailing color, though there are some white-flowered species. One of these, *Bidens leucantha*, is one of the most widely distributed of the whole family.

EXPLANATION OF THE PLATE.—1. Lower section of a flowering stalk. 2. Upper section of the same showing the transition from a tripartite leaf to the simple form. 3. Single floret with akene, somewhat enlarged.

WILD FLOWERS AND NATURE.

THE MOUNTAIN SAXIFRAGE.

There cleaving to the ground, it lies
With multitude of purple eyes,
Spangling,—a cushion green like moss.

ANONYMOUS.

VARIATION IN SPECIES.—I have been interested in your notes on variations from the common forms of plants; for I suppose there is no species that does not at times present these variations in a more or less pronounced form. Two years ago I ran on a patch of wind-flowers, in South Hadley, nearly every plant of which had a two-leaved involucre; and since then I have seen many in other places. On May 6th, my child Florence, while looking for violets, found a patch of wind-flowers of which nearly all the plants had a four-leaved involucre, while several were five-leaved—in fact, there were more five-leaved than three-leaved involucres in the patch. The flowers also had an unusually large number of sepals—almost tending toward a double form; and the under side of the visible sepals was, in many cases, a deep pink.

I have also noted a Painted Trillium (found in Belchertown) that had four leaves, four sepals, and an apparently four-celled ovary.

Amherst, Mass. L. H. ELWELL.

The study of variations among the individuals of species has become one of peculiar interest, since Darwin suggested that species came into existence by the hereditary persistence of such variations as gave an advantage in a "struggle for life." But such as these noted by Mr. Elwell, made by observers since Darwin's time, tend to show that variation results from varying phases of life-energy, which becomes weaker, till it finally expends itself. Change can, therefore, go only so far and no further. It is possible to find a "four-leaved" clover. It is possible by sowing seeds of the plant bearing four leaves to get a plant with an hereditary four-leaved character; but the most enthusiastic believer in this form of evolution would hesitate on the possibility of a palmate leaf, like a lupine, ever being evolved in this way.

HABENARIA GRANDIFLORA.—Having occasion, lately, to refer to an herbarium of dried plants which I collected perhaps fifty-five years ago, I noticed that one of them, which was a prime favorite with me in my boyish days, was no longer recognized as a species by Gray. In the last pocket edition of his Manual, the name of *Habenaria grandiflora* no longer appears, and in the previous edition it is only mentioned as a synonym of *Habenaria fimbriata*.

My feelings were a little like those expressed to me on one occasion by my valued friend, the late Isaac Burk, who grumbled at the necessity of going to school again in his old age, in order to keep up with the changes in botanical nomenclature. But it was some comfort to find that the *Hortus Kewensis*, which is recognized as a standard authority, retains both *H. grandiflora* and *H. fimbriata* as separate species.

My early determinations of these species were based on the descriptions of Darlington and Beck, both careful botanists, the latter of whom is remarkable for the brevity and accuracy of his descriptions. In a note appended to the description of *H. grandiflora*, he says: "Flowers twice the size of *H. fimbriata*, from which it also differs in the form of the lip." Darlington also alludes to the resemblance between the two species, remarking, "This is a superb plant, and allied to the preceding,—*H. fimbriata*—though doubtless sufficiently distinct."

I suppose this "superb plant" is more abundant to the eastward than it is here. I know of but four localities in which it grew in former years in Chester County, Pa., the scene of my early exploration. I first found it about 1831, on the Westtown school farm, in a low piece of swampy ground, over-grown with trees and bushes, among which I waded up to

my knees in mire. This locality has since been cleared, drained and ploughed up, and though it has yielded corn and grass, it may well be supposed that the *Habenaria* has disappeared. Yet there is something mysterious in the disappearance and return of plants of this class. A botanical friend, with whom I was closely associated sixty years ago, the late Edward Tatnall, of Wilmington, Delaware, wrote to me respecting localities. "The *Orchidaceæ* are among plants what the gipsies are among people, and are seldom found twice in the same locality. I once found a locality of *H. fimbriata* in which there was probably a hundred plants; but although I have visited the place a number of times since, I have never seen a single plant."

The favorite localities for Habenarias are along rivulets, where the upswelling of springs furnishes a loose, boggy soil for the plants to grow in. Although nearly sixty years have elapsed, I think I could still go to some of the spots where *H. grandiflora* formerly grew, although it would be with but faint hope of ever meeting with specimens. Two of these places are in the vicinity of Westtown, in the gneiss formation, and another in the hydromica shales of the South Valleyhill of Chester County.

It is a well-known fact that some plants require the visits of insects to so bring the pollen of the stamens into contact with the pistils as to ensue their fertilization and the perfecting of the seed. Thence a condition of the weather that prevents the visits of such insects is one of the causes that may operate to prevent a succession of plants in any definite locality; and to this may possibly be ascribed, in part, the fact mentioned by Edward Tatnall of the disappearance of *Habenaria* from a well-stocked locality. L. WALTON.

Chester Co., Pa.

It is now conceded that Dr. Gray was mistaken in regard to these plants.

In reference to the non-appearance of orchids in some seasons, it was found by accurate observations in England, with native species of that country, that the tuberous-rooted orchids will, at times, remain dormant several years, without making any foliage.

KRIGIA AMPLEXICAULIS. — I send you a specimen of *Adopogon Virginicus* (L.) Kunze; *Krigia amplexicaulis*, Nutt; *Cynthia Virginica*, Don; Virginia Goatsbeard.

This showy little perennial *Compositæ*, having a large cluster of root leaves and a stem from one to two feet high; a single clasping leaf and bearing reddish-yellow flowers, has had a number of names conferred on it by botanists.

It was not known to belong to Lancaster County, Pennsylvania, until 1884, when it was found growing along the Conestoga Creek, below Churchtown, and again in 1892, along a stony, unused road on the Welsh Mountain, near Beartown, in the same State.

It can be cultivated. One plant, brought from Beartown in 1892, and planted in a flower bed in a yard in Lancaster City, has increased to four plants, the leaves with a spread as large as a tea plate. After its removal to Lancaster, it blossomed profusely in June; and this year, 1898, it blossomed again in September.

It has been collected in Berks and Chester counties. MRS. AMELIA F. EBY.

Lancaster, Pa.

Besides the names quoted by our correspondent, it was classed by Linnæus with the Salsify family, and known to him as *Tragopogon Virginicus*, literally, the Virginian Goatsbeard. *Index Kewensis* adopts the name originally given by Nuttall, *Krigia amplexicaulis*.

ROSA RUGOSA IN A NURSERY CATALOGUE.—In a prominent nursery catalogue, the cover appears so dainty it might be adorned with lace and embroidery, upon which a star has fallen. *Rosa rugosa* is illustrated within.

The rose has been named the queen of flowers, and as Edmund Spenser has been called "the poet's poet," may not as well *Rosa rugosa*, the Roses' Rose? Judging from its appearance in this catalogue, it is pre-eminent in beauty, in foliage, fruit and flower. And in bloom or out of bloom, must be an ornament to any garden.

Once were brought me eighty large, old-fashioned red roses, from a field from which the house had long since disappeared, but the roses flourished still, a monument to departed love and care. Who would desire a sweeter monument than the fragrance and beauty of roses? E. E. O.

SPANISH PALMETTO.—"The Spanish Palmetto is a species of palm tree growing in the West Indies and Southern United States, of the genus *Chamærops*.

By the natives of Florida, it is called the Cabbage Palmetto, or more commonly simply 'cabbage'. It is not, however, the true cabbage tree, *Euterpe montana* or *Areca oleracea*, found in the West Indies and northern part of South America, but, like the terminal bud, is tender and succulent, and edible either raw or cooked, being a white whorl of embryo leaves, the real end of the trunk, above and around which the leaf stalks of the frond project. The leaves are often from four to six feet long, and three to four feet wide, and the stems six to eight feet long.

In 1876, both the present managers of the Hotel Ormond lived in log camps thatched with these leaves, and at the time camps made of long pole frames covered entirely (sides and roof) with palmetto leaves were common and known as 'Palmetto shanties.'

The divided base of the leaf stalk, that clings to the trunk even after the leaf has dried and part of the stem has broken and fallen off, is called a boot-jack, and when sound can actually be used as such. As the tree matures, the boot-jacks fall, the lower ones first, and leave the clean, light gray trunk of the older trees."

To the above, kindly communicated by our friends, Anderson & Price, Ormond, Florida, it may be added that the other plant in the pretty picture is probably *Yucca aloeifolia*, a true native of Florida.

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THE DEATH-CUP MUSHROOM.—Of the genus *Amanita*, to which the Death-Cup belongs, authorities say that it is responsible for the majority of deaths from mushroom poisoning. Strange to say, some species of this genus are also pronounced edible, making delicious dishes.

According to plates prepared by Dr. Taylor, an authority on the subject, the Death-Cup, *Amanita phalloides*, is of a dusky brown color, not as gaudy as the Fly Mushroom which is less poisonous, nor yet as delicately colored as the Orange Amanita, *A. Cæsarea*, an edible one. Dr. Taylor figures two other edible species: *Amanita rubescens*, The Blusher, a dark

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INTENTIONAL SECOND EXPOSURE

brown species, and *A. strobiliformis*, Fircone Mushroom, the latter being particularly characterized by white warts scattered over the upper surface.

The chief distinguishing points between the Death-Cup and the common edible mushroom, are the absence in the case of the edible one of the white cup-shaped wrapper in which the stem appears to stand and the presence of pinkish (in young specimens—brown or black in older) gills on the under side of the head or cap. A very small portion is sufficient, in many cases, to cause death, and the amateur should be positively able to identify the mushroom he gathers for the table. The work of Dr. Taylor, referred to, is valuable for reference in identifying them.

TREES RECORD THEIR OWN HISTORY. — Strange though this may seem, yet it is true, whether we are able to read it or not.

Most any one can tell the age of a tree by its rings, and here let me say, there are three ways to tell: two by the inside, and one by the outside.

The methods of counting the years of a tree from the inside are first by cutting a tree down and sawing off a section or block and counting the rings or circles, which any one can do. Another way is to split the block open and count the sections on a medullary ray; it will be found that each section corresponds to each ring, or one year's growth. The third way is to count the spaces between the rows of limbs on a standing tree. This is easily done on the spruce, pine, etc. It will be observed that some spaces are longer than others, corresponding to a thicker growth of the corresponding ring and a longer section of the medullary ray. I have a large number of bits of wood, both of maple and beech, illustrating these statements.

So much for the tree's record of its own age. Trees also indicate their locality where grown, whether on a mountain or in a valley, also the color and nature of the soil, amount of sunshine, temperature, moisture, etc.

Again, trees reveal the points of compass, especially the hemlock, by its extreme top leaning to the East. It has often been noticed that the heart of some trees is far from the center, near one side. In such a case, the tree is well fed on one side and lacking food on the other. A ledge on one side, and fruitful soil on the other, makes the difference, and accounts for the position of the heart.

A tree also indicates barometric conditions, by absorption of moisture through the roots, on certain days, and from the atmosphere through the body of the tree. It also indicates the days on which they will not absorb.

So a tree, especially the maple, indicates the difference between a heavy and a light atmosphere or when the mercury is high or low in the barometer.

By a certain experiment I have with the maple, in the summer, when the tree is in leaf, I notice these barometric conditions.

When the tree is not in leaf, by a few experiments, especially during sap-flow, I can not only tell when the tree is in pressure and suction, but I can tell the amount, in pounds, to the square inch.

So we see a tree has a wonderful record of facts, whether we are able to read them or not.

Moscow, Vt. TIMOTHY WHEELER.

X-RAYS USED IN BOTANY.—"Dr. Van Heurck, well-known in the world of learned men," says, *La Semaine Horticole*, "has lately become distinguished by his remarkable work in radiography. The learned lecturer of the Botanical Gardens at Anvers, showed recently the results he had obtained by X-rays in the plant world. He had successively photographed a flower of *Pavonia Brakoyana*, fruits of *Arachis*, *Tamarindus Indica* (here the embryo was seen with surprising clearness), *Papaver somniferum* (an admirable proof, giving a desirable drawing of cells and seeds enclosed in the head of the poppy) a pea-pod, and the fruit of a *Proteaceæ*.

These recent efforts demonstrate, without doubt, that in the domain of botany, the X-or Roentgen-Rays will render service as well as in zoology, embryology, surgery etc.

ANNUAL WOOD-GROWTH.—It was shown in a paper published by the Academy of Natural Sciences of Philadelphia, some thirty years ago, that the annual deposit of wood in tree-trunks is all formed during a few weeks at midsummer. Practical knowledge moves slowly. There is a large amount of valuable facts stored away in the annals and proceedings of institutions awaiting some industrious compiler who would earn the gratitude of the community for his task.

GENERAL GARDENING.

THE GOOD GARDENER.

Ho so wyl a gardener be
Here he may both hyre and se
Every tyme of the year and of the mone
And how the crafte shall be done
Yn what manner he schall delve and sette
Both Yn drowth and Yn (the) wette
How he schall hys sedys sowe
Of every moneth he must knowe
Both of wortys and of leke
Ownyns and of garleke
Percely, clary, and eke sage
And all other herbage
Wt a dybble pu schalt ham sette
That pe dybble before be blunt and grete
Three ynches depe they most sette be
And thus sayde Mayster Jon Gardener to me.

—An English Work of 1440.

MOTH HUNTERS OF MASSACHUSETTS. — In the spring, summer and autumn, the sojourner in the suburbs of Boston and the towns within a radius of about ten miles of the city, will see, in the woods and fields, in gardens and lawns and private grounds and along the roadsides, men carefully scrutinizing the trees, shrubs, fences and stone walls.

These men are in the employ of the Commonwealth of Massachusetts, and the object for which they work is the extermination of the gypsy moth, *Porthetria dispar*, a pest of European countries, introduced into Massachusetts in 1868 or 1869, by Leopold Touvelot, a French artist, naturalist and astronomer. M. Touvelot now living in Paris, was at that time residing in Medford, a few miles west of Boston, where he attempted some experiments in raising silk from our native silk-worms, and also introduced European species for the same purpose. It is said by people living in that vicinity, in 1869, that some of the eggs that M. Touvelot had imported, were blown from a window of the room in which he kept them. Others state that some of the insects escaped in larvae form. At any rate, its escape appears to have been accidental, and Touvelot, being aware of the dangerous character of the pest, and finding his efforts for its eradication futile, gave public notice of the fact that the moth had escaped from his custody.

For several years after the moth escaped it attracted no attention. People who witnessed, in 1869, the first extensive outbreak of the moth in Medford, and thus became acquainted with its voracious habits, and its productive powers, were unable to understand how so destructive a creature could have existed unnoticed for twenty years; but its lack of conspicuous markings, which to the common eye would distinguish it from other species, and its habits of concealment and night feeding will explain its unheeded distribution. Within twenty years it had spread into thirty townships and gained a foothold in each without attracting public attention.

The caterpillars devour the foliage of nearly all species of trees and plants, and in the worst infected districts, when the trees are stripped of their leaves, the fruit itself is partially eaten. At first the citizens residing in infected districts spent their leisure time fighting the insects, thus for a time in a great measure protecting their shade and fruit trees and shrubs. Finally the moth spread to waste land and great tracts of woods, where it grew apace, until the advances of the ravenous larvae could no longer be stayed by individual effort. Vast areas of woods, attacked by the moths, looked as though they had been swept by forest fires.

Finally, in 1889, specimens of the moth were sent to Professor Fernald, entomologist of the Hatch Experiment station at Amherst, who, after exhaustive investigations, identified it as the "gypsy moth." In December of that year, Professor H. H. Goodell, president of the Massachusetts Agricultural College, wrote to Governor Brackett, urging that measures be taken by the incoming Legislature to provide for the extermination of the moth. The Governor treated the subject in his inaugural message, and a petition for legislation for the extermination of the moth was presented to the Legislature by the selectmen of Med-

ford, January 15, 1890. Other petitions followed from some half a dozen towns and cities, also from the Massachusetts Agricultural College, the Essex Agricultural Society and the Massachusetts Horticultural Society. In accordance with the provisions of an act passed by the Legislature that year, the Governor appointed a salaried commission. This commission began its labors by a partial inspection of the known infected district for the purpose of discovering and marking the infested trees, shrubs and other objects. The infested trees were marked with a red tag. This district did not exceed one-half mile in width and one and one-half miles in length. The examination of 1890, justified the commissioners in the assumption that fifty square miles of territory were more or less infested. To an appropriation of $20,000, another of $25,000 was added and the force of men employed was increased to eighty-nine. During the month of April many eggs of the moth were scraped from the trees, and destroyed. Early in May, the spraying of infested foliage with Paris green was begun and continued until about the middle of the month. This was the principal work of the summer, and fifty teams were used. Another feature of the season's work was the guarding of the highways leading from the infested districts, with a view to further preventing the dissemination of the moths by vehicles; and officers were kept on duty along the roads twelve hours in the day. Large kerosene torches were used to burn the clustering caterpillars, and considerable cutting and burning of infested bushes was also done. The cavities of trees along the highways were closed with cement. On March 20, 1891, actual field work was begun, under the supervision of entomologists from the various colleges. Later in this year, the commission was superseded by the State Board of Agriculture, from which a committee was appointed, to continue the work.

In apportioning the territory to the different inspectors, it was found necessary to make a hasty survey of the field and plat it on maps. These maps were divided into sections of such size as could conveniently be carried by the men engaged in field work. For convenience these maps were drawn so as to be bounded by town lines, streets and railways, or by natural bounds, such as streams and lakes. A foreman was responsible for the work on each tract or section. When field operations began the eggs of the moth were the only form of the pest. The men were taught how to recognize and destroy them, and to distinguish them from those of native moths. When eggs were formed on a tree or other object, certain characters were marked upon it with white paint, and the locality was designated on the map. As the season advanced the number of men employed was increased. Each inspector was instructed to make out a daily written report of the work done by himself and men, and to incorporate in these reports his observations on the habits of the moth and its parasites, notes on its distribution and all useful information acquired by him in regard to the moth or methods of eradicating it.

The operations of the moth hunters were accompanied by some amusing features. The first was during the rigorous police patrolling of the roads, when all teams and carriages were halted and inspected, to the amusement of some and the disgust of others. Then there was considerable opposition to the use of Paris green for spraying, manifested by many people living in the infested towns. A mass meeting of the opponents of spraying was held in Medford. One citizen, who attempted to cut the hose attached to one of the spraying tanks and threatened with violence the employee of the board who had entered upon his land, was arrested and fined. Others neutralized the effects of the spraying by turning the garden hose upon the trees and shrubs that had been sprayed, thus washing off the solution.

Important entomological work was meanwhile accomplished, and several parasites of the moth were discovered. Dead pupæ were saved in order that the parasite might be studied. In fact, no source of knowledge, which might aid the work, was disregarded. The committee even went so far as to secure full information with regard to European experiences with the gypsy moth, and the methods employed in Europe to combat it; and all information gained, from all sources, was tersely embodied in a report to the Legislature.

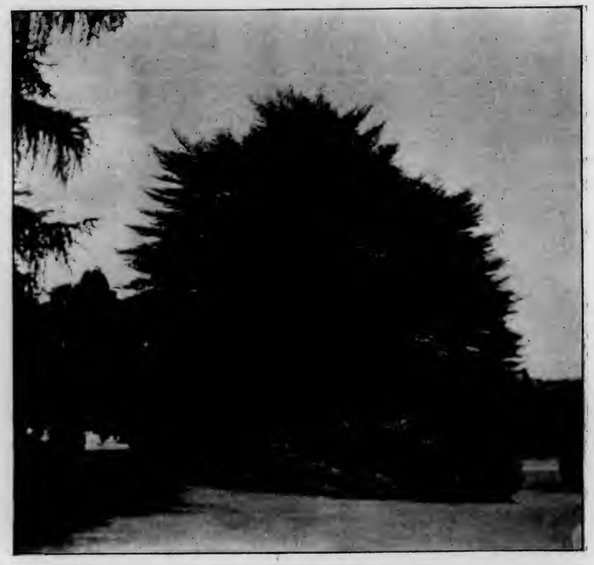
The study of the productive powers of the moth is most interesting. The number of eggs deposited by the female averages 450 to 600, and each egg cluster produces about 1000 caterpillars. Because of the great number of plants utilized by the moth for food, it is capable of subsisting in almost any locality. It is worthy of note, however, that the most densely infested areas very nearly coincide with the centres of population, and the moth colonies are larger or more numerous in or near thickly populated districts.

The work of exterminating the moth has continued to the present time, under annual appropriations by the Legislature; and the numbers of the moths and the extent of territory occupied by them has been greatly reduced. Still, the end of the work is by no means in sight. In the work, a great number of specially devised implements and tools are used; and beside the methods of destruction already mentioned, chemicals are used to kill the eggs, hand-mirrors being used to inspect the undersides of fence rails, door-steps and other similar places. Trees are bandaged by encircling the trunks with some substance which the larvae cannot cross; and burlap and tarpaulin bands are also utilized. Besides Paris green, London purple and arsenate of lead are used for spraying, and power spraying machines are used for orchard and field crops.

There is no doubt in the minds of those acquainted with the facts, that the gypsy moth can be held in check where it now is, and that it can be exterminated if sufficient resources can be secured and vigorous measures taken; for it is known to a certainty that the moth is confined to Massachusetts. It would seem that the general government should interest itself in helping to continue the work which Massachusetts is now carrying on at her own expense.

ALLAN ERIC.

CUT-LEAVED BEECH.—Among the especially beautiful ornaments of our gardens, the Cut-leaved Beech holds a high place in common with its ally, the Fern-leaved Beech. A fine specimen is the more highly valued from the variety being of rather slow growth. Few finer specimens may be seen than the one here illustrated, which is growing on the grounds of a rare lover of gardening, Mrs. Berwind, of Wynnewood, Pa.



CUT-LEAVED BEECH.

THE TULIP TREE,—LIRIODENDRON TULIPIFERA.—We often learn more about familiar things by noting how they strike strangers. The following, translated from Müller's *Gartner-Zeitung*, in an article written for that paper by Mr. Rudolph Krause, a nurseryman of Thomberg, near Leipsic, will interest our readers:—

"*Liriodendron tulipifera*, the Tulip-tree, a native of the United States, is found in parks very frequently, but not to the extent it deserves. This ornamental, shade-giving tree attains a height of from 30 to 35 feet, and should be more considered, as it is not only as a single or group-tree, but also for row-planting along walks and carriage roads. The yellow flower resembles a large tulip, appears in June and July, and is well liked in bouquets. The seeds are winged, standing around a central axis, forming a cone. This tree, belonging to the Magnolia family, demands careful planting on account of its thick and fleshy roots.

"A notable variety, with varigated leaves, is the *Liriodendron tulipifera fol. aureo-marginatis.*"

How to Keep Dahlias.—As soon as the roots are taken out of the ground, shorten them one-half, then spread them out in a covered place to keep them dry. Many people winter them in a cave, but they are liable to suffer from dampness. It is therefore better to place them in a shed covered in such a way that the frost cannot touch them.

The young tubers of the first year are put in a box, covered with dry sand, and kept in a dry place sheltered from the frost.

—*La Semaine Horticole.*

Pansies.—There are so many beautiful garden flowers that no one need be criticized for being unable to name a preference. One that is considered choice by everyone is the pansy—and well may it rank high. Improvers have brought it to a beautiful stage where almost any color and shade may be had, from a total black to a pure white,—and even various petals are in separate colors, nicely blended. They are almost of a hardy character and can be brought to bloom in cold-frames during winter, besides enjoying their pretty blossoms all summer.

Hardiness of Lavender Plants. — It would be quite correct to say that lavender is very hardy, though the past winter, unusually severe, killed some plants.

A correspondent inquires if it will thrive in a shady location and moist. Very few evergreens like such a position, and lavender is not known to be one of them. In sunny gardens and dry soil it thrives perfectly, and it is only strange that it is not more common.

The foliage and stems are not lavender color, as usually recognized, but are silvery gray. The small flowers make that wonderful color so popular with the ladies. But all stems, leaves and flowers have that pleasant aroma which makes it so useful.

Cedar of Lebanon.—Whether the archbishop of Damascus is correct or not in his assumption that Solomon planted the Cedar of Lebanon with his own hands in the quidnunc manner, as they now stand in the valley on Mount Lebanon, we will not venture an opinion. Lamartine, who visited these trees in 1832, very properly says: "They are the most renowned natural monuments in the universe." Religion, poetry and history have all equally celebrated them. In Washington, they have flourished forty years without injury. At Claremont and Sion House in the neighborhood of London, these cedars are over 100 years' old and eighty feet in height. At Hopton House, near Edinburgh, and at Beaufort Castle, in the highlands of Scotland, there are trees over 100 years' old. At the latter place it is said the tree rises with all that boldness of outline and permanence of aspect which renders it the glory of Lebanon and the boast of Palestine. It is to be hoped that this tree will be more planted in the future. It is especially adapted to cemeteries.

W. R. Smith.

NEW OR RARE PLANTS.

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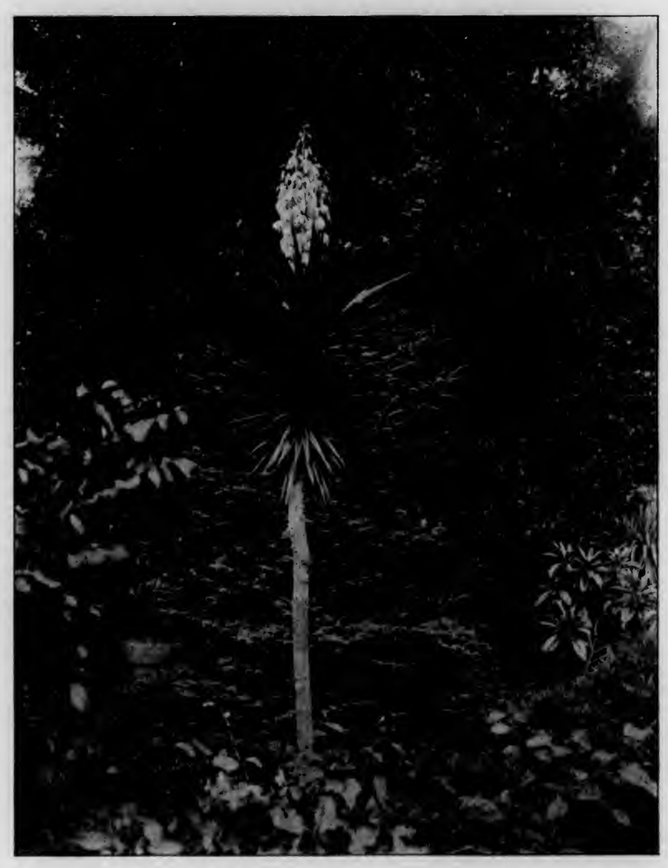

YUCCA ALŒIFOLIA VARIEGATA.

THE HARDY FLOWER GARDEN.

Petasites officinalis. — Relative to the article of mine on bees and their guidance to insignificant blossoms, in the May number of your valuable Monthly, I must tell you of another observation, that color of bright hues is not always necessary for them to find their nectar.

In the middle of April, almost before crocus and snowdrops appear, there lifts, from the ground in my garden, a flower, a round club-like head, at whose point a few little ray blossoms of whitish color open, set on a bare pink-purplish stalk.

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How to Keep Dahlias.—As soon as the roots are taken out of the ground, shorten them one-half, then spread them out in a covered place to keep them dry. Many people winter them in a cave, but they are liable to suffer from dampness. It is therefore better to place them in a shed covered in such a way that the frost cannot touch them.

The young tubers of the first year are put in a box, covered with dry sand, and kept in a dry place sheltered from the frost.

—*La Semaine Horticole.*

Pansies.—There are so many beautiful garden flowers that no one need be criticized for being unable to name a preference. One that is considered choice by everyone is the pansy—and well may it rank high. Improvers have brought it to a beautiful stage where almost any color and shade may be had, from a total black to a pure white,—and even various petals are in separate colors, nicely blended. They are almost of a hardy character and can be brought to bloom in cold-frames during winter, besides enjoying their pretty blossoms all summer.

Hardiness of Lavender Plants. — It would be quite correct to say that lavender is very hardy, though the past winter, unusually severe, killed some plants.

A correspondent inquires if it will thrive in a shady location and moist. Very few evergreens like such a position, and lavender is not known to be one of them. In sunny gardens and dry soil it thrives perfectly, and it is only strange that it is not more common.

The foliage and stems are not lavender color, as usually recognized, but are silvery gray. The small flowers make that wonderful color so popular with the ladies. But all stems, leaves and flowers have that pleasant aroma which makes it so useful.

Cedar of Lebanon.—Whether the archbishop of Damascus is correct or not in his assumption that Solomon planted the Cedar of Lebanon with his own hands in the quidnunc manner, as they now stand in the valley on Mount Lebanon, we will not venture an opinion. Lamartine, who visited these trees in 1832, very properly says: "They are the most renowned natural monuments in the universe." Religion, poetry and history have all equally celebrated them. In Washington, they have flourished forty years without injury. At Claremont and Sion House in the neighborhood of London, these cedars are over 100 years' old and eighty feet in height. At Hopton House, near Edinburgh, and at Beaufort Castle, in the highlands of Scotland, there are trees over 100 years' old. At the latter place it is said the tree rises with all that boldness of outline and permanence of aspect which renders it the glory of Lebanon and the boast of Palestine. It is to be hoped that this tree will be more planted in the future. It is especially adapted to cemeteries.

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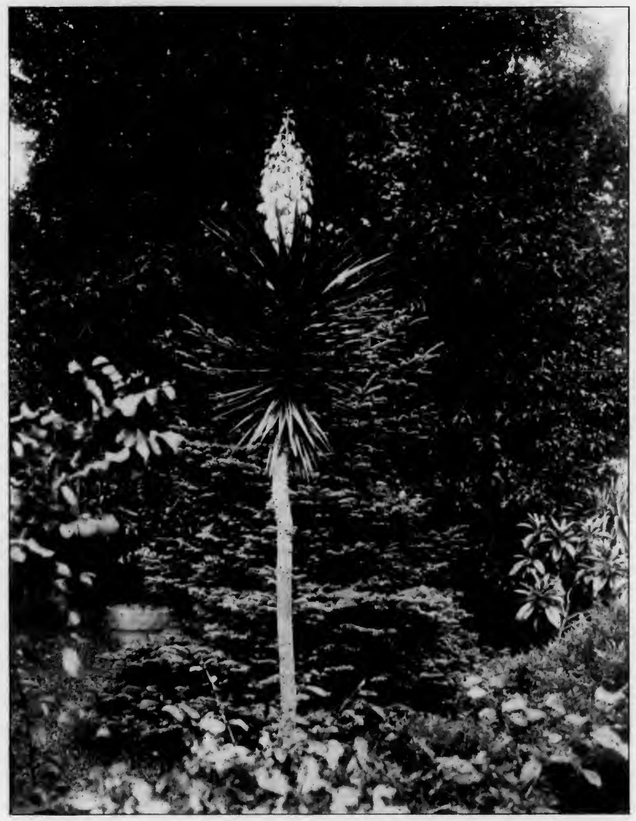

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INTENTIONAL SECOND EXPOSURE

discernible from the yet bare ground of the surrounding earth and dry vegetation. Yet the honey bees in great numbers find them, although I am not aware that in any near neighborhood such are kept. What mystery guides them from afar to this coveted spot? Truly it is a most wonderful fact to meditate over. And now I must describe this interesting flower a little more. I have had about 20 blossoms from it this season. The leaves expand later, and as the hollow flower stalk grows higher, the little flowerets gradually grow, too; and open all in a circle around it. For two seasons, I had it not knowing the correct name; but this spring, I made an effort to obtain it, and Mr. James N. Bishop, in Plainville, Conn., who is an authority on botanical matters, tells me that its name is *Petasites officinalis* (a European species). With this guide, I looked over my German catalogue of plants, and found the following: *Petasites vulgaris.* Compositæ—X. Eupatoriæ. Common name, Pestilence-wort. No doubt it has been used for medicinal purposes.

The roots of it are plenty and very spreading underground. I find new shoots coming up from the main plant as far as six feet away. It has stood our severe winter unprotected, and blossoms so early in all our cold, that it is desirable alone on this account. I know of no other flower whose top blossoms open first and later the lower ones follow. Hyacinths and such, as you will know, always open the lower flowers first.

The leaves grow to immense size and 3 feet high, wooly stalks, and are about that broad and long, heart-shaped and the whole resembling a large rhubarb plant when out of bloom and fully grown. It needs plenty of room to expand in. MRS. WILHELMINE SELIGER.

Hartford, Conn.

This striking foliage-plant has a fine effect, and, as our correspondent suggests, is deliciously fragrant in flowering time. It has a deeply-rooting and defiantly-spreading character,—but this has no terrors to those who understand the business of getting rid easily of a troublesome customer.

ROSA RUGOSA.—Coming into bloom at the same time with the rhododendron, the *Rosa rugosa* puts in a claim for the prize of beauty. It would be hard to decide, for a bush 6 or 8 feet high is an impressive sight. The rhododendron may plead its evergreen leaves as adding to its flowering claims,—on the other hand the bright red haws, which in the fall the Rugosa Rose displays, may be a fair set-off to the plea of the beautiful evergreen.

MICHAUXIA CAMPANULOIDES. — Though a French botanist, the name of André Michaux is inseparable from the history of American botany. Not only the man of abstract science, but the lover of flowers, is continually confronted by his name. It is to be regretted that some fine American genus was not dedicated to him, but L'Heritier commemorated him in the curious genus *Michauxia*, illustrated on page 109, and which illustration has been transferred from the French magazine *Lyon-Horticole*. As will be seen from the picture, it differs from ordinary bellflowers in having the corolla deeply divided, with the segments reflexed, as in the Tiger Lily. It has reddish flowers, which is rare in campanulaceous plants. It requires the same treatment in our country that would be given to a fox-glove.

After all, the travels of Michaux extended to Syria and Persia, and he died in Madagascar on the 23d of November, 1796, in the 50th year of his age.

FRUITS AND VEGETABLES.

HYBRIDIZING APPLES AND PEARS.—In MEEHANS' MONTHLY, May '99, page 78, commenting on the hybridizing of apples and pears, is remarked that "it is not improbable that the apple and pear might hybridize and it is surprising that no actual test has been made." Permit me to state that such a test has already been made, although no account of the work has yet been published. For several years, there was growing in one of the apple orchards at this station, a Flemish Beauty pear top-worked on an apple tree. In 1892, four clusters of blossom buds on this tree were emasculated before the buds opened. They were pollinated with pollen of Oldenburg apple and kept covered with paper bags to exclude other pollen. Each set fruit, but by July all of the fruits, except one, had dropped. One fruit developed normally, except that it was small as compared with the other fruits on the tree, and was not symmetrical in shape. It contained

three plump seeds, two that were slightly filled and three that were abortive. Several other fruits from the same tree were examined, but none contained more seeds than this one which resulted from hybridizing with the Oldenburg apple. The seeds were stratified in a pot of sand and buried in a frame. In the spring they were sown in flats. One seed grew. It was potted and afterwards transplanted to a cold frame, but finally damped off.

At the time when the blossoms were pollinated with the Oldenburg pollen, six of the Flemish Beauty clusters, having been prepared as before, were pollinated with Rhode Island Greening pollen, five with Tompkins King pollen and two with Transcendent Crab pollen. But two of these blossoms set fruit, and they were pollinated with Rhode Island Greening pollen. By July, thes fruits had dropped.

MICHAUXIA CAMPANULOIDES.—SEE PAGE 108.

In 1898, a few clusters of Ben Davis apple were pollinated, under my direction, with pollen from Sheldon, Clairgeau and Bosc pears, and one cluster of Seckel pear with pollen from Rome Beauty apple. None set fruit except one cluster of Ben Davis by Sheldon. These fruits dropped during the summer.

We have, as a result of these tests, positive evidence that the pear will hybridize with the apple; but we have not sufficient evidence to show that the pear will set fruit freely when supplied with none but apple pollen.

S. A. BEACH.

New York Agricultural Experiment Station.

For this particularly interesting paper by Professor Beach, the hope may be expressed that the experiments may be continued. It is now well-known that there is a wide range of variation in the individuals of any species, wholly independent of what is understood by hybridization. It becomes necessary, therefore, to repeat experiments before hybridization is established. There are those who doubt the Kieffer Pear to be anything more than a variation, independent of hybridism. The evidence so far, as is well indicated by Prof. Beach's paper, favors the view of the possibility of the occurrence.

NEW STRAWBERRY, STAR.—The list of strawberry varieties is getting so large, it is difficult for an intending purchaser to select among them. Perhaps the best plan, after first engaging well-tried, standard kinds, is to give the new candidates a trial. The Star is one of the latter, introduced by E. W. Reid, Bridgeport, Ohio.

RESULTS OF PEAR-GRAFTING.—G. S. writes: "Four or five years since, I grafted some pear trees, eight to ten years' old, in healthy condition but which bore unsatisfactory fruit. They were cut back to within about one foot of the trunk, and scions taken from a vigorous Bartlett growing near, side-grafting being the method employed.

The tree bore fruit last season, but was quite a disappointment, fruit more resembling the original small, round, sour pear. Can you inform me as to the cause?"

Such a result is unnatural and would seem to point to an unnoticed failure of the scions, and a continuation of the old growth. If the scions were true, the fruit should have been true Bartlett. Without personal observation, it is difficult to form a positive opinion. It is worth trying again.

BIOGRAPHY AND LITERATURE.

THE EXPLORER.

To sit on rocks, to muse o'er flood and fell,
To slowly trace the forest's shady scene,
Where things that own not man's dominion dwell,
And mortal foot hath ne'er, or rarely been;
To climb the trackless mountain all unseen,
With the wild flock that never needs a fold;
Alone o'er steeps and foaming falls to lean;
This is not solitude; 'tis but to hold
Converse with Nature's charms, and see her stores unroll'd.

—BYRON.

SABBATIA.—In the last issue of MEEHANS' MONTHLY, a correspondent quotes the statement made by modern botanists in regard to the person to whom the genus was dedicated. Sir. J. E. Smith, writing in the early part of of this century, says it was "named by Adanson after two Italian botanists, editors of part of the expensive but useless *Hortus Romanus*, which the authors of *Hortus Kewensis* very properly declined quoting on the avowed ground of its inutility. Adanson, indeed, writes the word *Sabatia*, but we presume that was his intention." How modern botanists came to modify this harsh criticism of Sir J. E. Smith so as to make the genus apply to "an eminent Italian botanist," does not appear.

FOX-GLOVE AGAIN.—If a few words more anent the etymology of this plant name may be permitted, I would call attention to the explanation given by Dr. Prior in his excellent book, "On the Popular Names of British Plants," a work which no one should be without who is interested in the common names of our flowers. He speaks the word of fox-glove as "a name that is so inappropriate to the plant, that many explanations of it have been attempted, by which it might appear to mean something different from the glove of a fox. Its Norwegian names, *Rev-bielde*, fox-bell, and *Reveleika*, fox-music, are the only foreign ones that allude to that animal; and they explain our own as having been in the first place *foxes-glew* or *music*, (Anglo-Saxon *gliew*), in reference to a favorite instrument of earlier times—a ring of bells hung on an arched support, a tintinnabulum—which this plant, with its hanging bell-shaped flowers, so exactly represents." Britten and Holland, also good authorities on English plant names, state that in various parts of England and Wales, the flower goes by such names as Fairy-cap, Fairies' Thimbles, Fairies' Petticoats, Fairies' Glove and Fairies' Fingers, thereby showing a connection in the popular mind between this plant and the "good folk," as the fairies are called by the superstitious. This latter explanation supports the views advanced by your correspondent, Alice Clary Earle, in the May number.

Philadelphia. C. F. SAUNDERS.

HOW TO PLAN THE HOME GROUNDS.—Published by Doubleday & McClure Co., New York. Among those who have worked for the advancement of intelligent horticulture in America, few deserve to be specially held in more grateful remembrance than Samuel Parsons, the founder of the great nursery firm of Parsons & Sons Co., of Flushing, New York. It must be gratifying to this venerable patriarch among garden lovers, that his son, Samuel Parsons Jr., is continuing the great labor of love to which he dedicated his own life. He will be proud, as we all are, to have this useful work in hand. It is a practical, helpful book, as the publishers are fully justified in saying, telling popularly and in detail how to beautify home grounds, be they small or large. It does not, however, stop here, but a good share of attention is given to public grounds in villages and larger cities.

THE LILIES.—Prof. F. A. Waugh has commenced a description of all the known lilies of the world. He recognizes sixty-four species. The first part, covering twenty-seven species, appears in the April issue of the *Botanical Gazette*.

THE BOULDER FERN. — The readers of MEEHANS' MONTHLY will be of the opinion that the following lines, contributed by some anonymous New York friend, are, in beauty of thought and rhythmic construction, far above the average of magazine poetry:

THE BOULDER FERN.

Dicksonia groweth in thickets deep,
Where the grouse and the rabbit hide
But she loveth best the boulder rock
On the desolate mountain side.

And there, though shaken by wind and storm,
The glint of her fronds is seen
As she wreathes about the lichened rock
A circle of delicate green.

Fitted by Nature's loving hand
To dwell in the fairest bowers,
She has grace and beauty in every line
And the fragrance of the flowers.

But oh, she loveth the free wilds best
And the cold gray boulder's side;
And there, adorning the rugged steeps,
Forever she will abide.

ORIGIN OF THE POTATO—SOLANUM TUBEROSUM.—Potatoes are also included in a collection recently examined. They are usually small, about an inch in diameter, and are much like the tubers of the wild plants found by the writer in the mountains of Mexico, at an elevation of 10,000 feet, and which occur from the United States to Chili along the Cordilleras. The size of the potatoes would argue that the Indians of Peru derived their supply from the wild plants of the mountains, as any primitive people might do; but Dr. Uhle informs me that it is a custom among the Andean Indians to prepare their potatoes, which are as large as our own cultivated forms, by a special preservative process, which much reduces their size. However this may be, it is not at all unlikely that the culture of potatoes has been much improved since the discovery, by contact with white men. DR. J. N. HARSHBERGER.

University of Pennsylvania.

R. A. ALEXANDER.—Mr. R. A. Alexander, one of the well-known scientific men of Canada, one of the chief founders of the Herbarium in the Hamilton, Canada, Scientific Association, was in early life a gardener, and had charge of the gardens of the Marquis of Northampton, in England. He was born at Errol, in Perthshire—the "Carse O'Gowrie"—Scotland.

MEDICINE IN NORTH CAROLINA.—When a prospective purchaser questioned the salubrity of the surroundings, the promoter, boomer, or whatever the agent of the new settlement is termed, protested that if there were any place on Earth where one did not get sick and die, he would like to go there to end his days. He probably had never heard of North Carolina. Sickness and death should at least be rare there if there be any virtue in medicine. Here is a catalogue of the medicinal plants of the State, and the list comprises over 450 species. It appears to have been compiled by Mr. Hyams, an herb collector for a drug agency, though issued by the North Carolina Experiment Station. Prof. W. F. Massey has evidently prepared the very careful and accurate index, but the main matter is astonishing. Still the attempt is made to employ the new nomenclature,—and what appears to be a tremendous mass of typographical errors, may be a grasp at some newly-polished mouldy name. Many names are duplicated. We have *Hepatica Hepatica*, *Alliaria Alliaria*, *Barbarea Barbarea*, *Abutilon Abutilon*, *Opuntia Opuntia*, *Foeniculum Foeniculum*, *Hypopitys Hypopitys*, *Sassafras Sassafras*, *Benzoin Benzoin*. *Phragmites Phragmites*, *Scolopendrium Scolopendrium*, as samples. In botany, the generic name is the noun and the specific the adjective, so we have to translate these as "the Hepatica that is the Hepatica," "the Sassafras that is the Sassafras," and so on. But the new nomenclature goes further than this. In this list we have *Polypodium polypodoides*,—that is to say, "the polypodium that is like a polypodium." This may be meant in an emphatic sense, as when the Boston clergyman, anxious to give a truthful opinion of every new born baby among his flock, assured the doting mother, "well that *is* a baby if ever there was one!" And there may be in the new style of plant names a hidden meaning for good after all.

WOOD AND GARDEN.—By Gertrude Jekyll. Published by Longmans & Co., New York. This is an American edition of an English work. It is written by an apparently wealthy lady, who rejoices in a comparatively small garden,—but who, though keeping her gardener and assistants, loves her garden, and takes an active part in doing as well as directing the garden work. Starting with the introduction,

the reader may feel he is entering on a prosy story. The author is apt to deal in long sentences; "or," "and" may occur half a dozen times in a single one.

But as we get along, we become interested in the story, and read them just as if we have in hand the natural correspondence of some familiar friend, whose heart is in the labor it is telling us all about. Just what she does in her own garden from month to month, and the comments on the gardens or garden work of others, is naturally and instructively told. Though some of her suggestions would not apply to many parts of our country, it is yet a work profitable to the general reader, and deserves a place in the amateur's library.

THE RELATION OF PUBLIC PARKS TO PUBLIC HEALTH,—is the title of a phamphlet prepared by Mr. Orlando B. Douglas, of New York, and issued by the "American Park and Out Door Art Association." It is unquestionable that the nearer we keep ourselves in contact with nature, the more we favor bodily health,—and that the general public health is favored by small parks and open spaces in towns and cities, has been demonstrated by actual experience. Numerous facts in support of this view are set forth in this able paper.

QUARTER ACRE POSSIBILITIES.—By Nutter and Keith, Minneapolis, Minnesota. This is a booklet of 38 pages, with designs and descriptions suggestive of beautifying small gardens and grounds, that are usually not thought worthy of the employment of a skilled landscape gardener. No more useful aid to those who are planning suburban homes has come before us. It was a good thought to prepare the work,—and the thought has been well embodied.

HOW TO KNOW THE FERNS.—How to know the Wild Flowers, by Frances Theodora Parsons, has filled a useful place in popular botany, and the same authoress now gives us "How to Know the Ferns." As in the former work, it is written in pleasing style, that makes the study itself an enjoyable one. Each species is illustrated in good form, so that there will be no difficulty in deciding what the descriptions have endeavored to prove.

GENERAL NOTES.

THE PLAGUE OF FLIES.—A correspondent says:—

"Can you inform me of an efficient and inoffensive way of destroying and preventing the propagation of flies about stables in the country? They sometimes become so numerous as to constitute a pest—not only about the stable but about the house."

In dwelling houses nothing has been found more efficacious, in keeping down the plague of flies, than catching them on fly-paper. It should be as useful in stables,—but it would be a pretty big undertaking, for it is understood that the chief breeding ground of the house-fly is the manure pile. Perhaps other more satisfactory methods can be given by some readers.

MEEHANS' MONTHLY,—ITS CONTENTS.—One of the merits claimed for MEEHANS' MONTHLY is that it is to be a permanent work of reference for all time. It is believed that no reference library can afford its absence from its shelves. That was the idea in issuing the "Flowers and Ferns of the United States." This is the object of its continuance as MEEHANS' MONTHLY. The reading matter in connection with popular science and gardening is selected with a similar object. Instead of a few elaborate articles collating what has already been gone over, or presenting views or notes of a temporary character, though well suited to mere newspaper publications, they give way to numerous substantial topics that might have a place in an encyclopædia and be of value for all time. This paragraph is written through a complimentary notice of our annual index. The conductors believe themselves that the compliment is deserved. For the number of pages given, we doubt whether such a list of topics worthy of permanent record is often given within such a space.

BLOSSOM DAY.—Under this style, the State Horticultural Society recommends that California shall have an annual legal holiday, when special honor shall be paid to the State's inimitable wild flowers, and blooming orchards, that give the State such world-wide eminence.

1 2 3

SOLIDAGO STRICTA.

SOLIDAGO STRICTA.

SLENDER GOLDEN-ROD.

NATURAL ORDER, COMPOSITÆ.

SOLIDAGO STRICTA, Aiton.—Very smooth throughout. Stem strict and simple; wand-like, not one-sided; slender, beset with small and entire appressed lanceolate-oblong thickish leaves, which are gradually reduced upwards to mere bracts,—the lowest oblong-spatulate, feather veined; heads crowded in a very narrow compound spicate raceme; rays 5 to 7. Gray's *Manual of the Botany of the Northern United States*, Chapman's *Flora of the Southern United States*, and Wood's *Class-Book of Botany*—all under the name of *Solidago virgata*. Gray's *Synoptical Flora of North America* as *Solidago stricta*.

This pretty Golden-rod was first described by Aiton in the "Hortus Kewensis," under this name apparently from specimens "cultivated in 1758 by Mr. Philip Miller." When Michaux explored our country he met this plant, and, regarding it distinct from other species already described, named it *Solidago virgata*, from its remarkably slender or virgate inflorescence. This distinction was recognized by most of our botanical authors, until Dr. Gray was able to show that Aiton's and Michaux's plants were specifically the same, except that Aiton's plant had a rather more branching form of inflorescence than usual.

As variation in such particulars is common in the genus, there is no reason for maintaining two distinctive names, and the prior one of Aiton has of necessity to stand for all the varietal forms. But, as often happens in the reorganizations of species, this conclusion rendered it desirable to take in the more branching form, hitherto known as *Solidago angustifolia* of Elliott, and which by Aiton was regarded as distinct from his *Solidago stricta*.

Under this modern view, Dr. Gray describes the latter as *Solidago stricta*, var. *angustifolia*. When these more branching forms of inflorescence are met with, the first impression is that they are to be referred to the sea Golden-rod, *Solidago sempervirens;* but they are easily distinguished by the latter having long narrow leaves, similar to the root-leaves, all along the stem,—while our species, as seen in the picture, has the leaves reduced to mere bracts when in that position. Aside from this, the *Solidago sempervirens* is one of the earliest to flower. In Florida it is frequently found in early Spring, and so far north as Atlantic City, on the New Jersey coast, the author has collected it soon after midsummer. Our species, *Solidago stricta*, is, however, among the latest to bloom.

In studying *Solidago*, most of the descriptions in our text-books are found to have been drawn from herbarium specimens; but the living plants will often aid us to distinguishing marks, which are absent in dried illustrations. There is much individuality of character in the little florets which the dried specimens do not show. This is true of most *Compositæ*, as well as of *Solidago* itself. If, for instance, the enlarged floret (Fig. 3 in the plate) be compared with a floret of *Solidago nemoralis*, it will be noted that the sudden expansion of the upper portion of the tube occupies more than one-half the length, and that the lower or slenderer portion is thicker in proportion to the upper half. The upper and thicker portion is cylindrical and not campanulate; while the purely triangular segments of the corolla are erect, and not recurved. In like manner the bristly pappus is somewhat appressed, while in other species it would be more or less expanding. It is difficult to get at these characters in dried specimens without a careful soaking in warm water, and the help of a good glass; but in fresh specimens they can readily be determined by the help of a pocket lens.

The florets are admirably arranged to insure self-fertilization,—as indeed is the case with the greater portion of the large order of *Compositæ*. The method adopted in this instance is shown in the enlarged drawing, Fig. 3. The anthers, as in compositæ generally, are united into a sort of crown, while the filaments are

COLOR PLATE

SOLIDAGO STRICTA.

SLENDER GOLDEN-ROD.

NATURAL ORDER, COMPOSITÆ.

SOLIDAGO STRICTA, Aiton.—Very smooth throughout. Stem strict and simple; wand-like, not one-sided; slender, beset with small and entire appressed lanceolate-oblong thickish leaves, which are gradually reduced upwards to mere bracts,—the lowest oblong-spatulate, feather veined; heads crowded in a very narrow compound spicate raceme; rays 5 to 7. Gray's *Manual of the Botany of the Northern United States*, Chapman's *Flora of the Southern United States*, and Wood's *Class-Book of Botany*—all under the name of *Solidago virgata*. Gray's *Synoptical Flora of North America* as *Solidago stricta*.

This pretty Golden-rod was first described by Aiton in the "Hortus Kewensis," under this name apparently from specimens "cultivated in 1758 by Mr. Philip Miller." When Michaux explored our country he met this plant, and, regarding it distinct from other species already described, named it *Solidago virgata*, from its remarkably slender or virgate inflorescence. This distinction was recognized by most of our botanical authors, until Dr. Gray was able to show that Aiton's and Michaux's plants were specifically the same, except that Aiton's plant had a rather more branching form of inflorescence than usual.

As variation in such particulars is common in the genus, there is no reason for maintaining two distinctive names, and the prior one of Aiton has of necessity to stand for all the varietal forms. But, as often happens in the reorganizations of species, this conclusion rendered it desirable to take in the more branching form, hitherto known as *Solidago angustifolia* of Elliott, and which by Aiton was regarded as distinct from his *Solidago stricta*.

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COLOR PLATE
INTENTIONAL SECOND EXPOSURE

entirely free. This crown of stamens is incurved at the apex, and presses over the top of the cloven stigma. While the young flower is being developed the stamens and pistil grow in equal ratio. But a period is reached when the stamens mature, and cease growing. The immature pistil continues its growth, and, by the aid of pressure against the incurved apex of the anther-crown, the latter is lifted up far beyond its place at the mouth of the corolla. But a period arrives when the filaments have been stretched to their utmost tension. When this point is reached, the still elongating style pushes the cloven stigma through the anther-crown, carrying with it the pollen grains. When the stigmas get wholly through, the elastic filaments draw back to their normal position, and the empty pollen cases are found at the mouth of the corolla again.

Those who are imbued with the idea that all flowers are so arranged that they can be cross-fertilized when self-fertilization fails, contend that the two lobes of the style are of necessity closed when engaged in clearing the anther cells of their pollen grains,—that the stigmatic surfaces are on the interior of the clefts, and that, on expansion, the lobes will be clear of own-pollen, and ready to receive that which visiting insects may bring from outside sources. But careful exclusion of visiting insects, by the use of gauze netting, results in every floret producing perfect seed for all the apparent absence of pollen grains on the interior faces of the cloven stigma,—and the inference is reasonable that the pollen tubes find an entrance by way of the margins of the cleft during the stigma's passage through the anther-crown. Thrips are often found in the heads of compound flowers, and these have been suggested as agents in cross-fertilization when winged insects have been excluded,—but as these do not travel from flower to flower, but locate themselves for the time being in a single head, there would be no physiological advantage in one floret receiving pollen from its fellow floret. In fact, it would not be regarded as cross-fertilization at all. In our illustration (Fig. 3) the floret is represented at that stage where the pistil has burst through the staminal crown, and the latter is withdrawing itself to its home within the corolla tube.

The American Autumn in North America furnishes scenes of wondrous beauty. Poets never tire of singing its praises. Longfellow observes:

"With what a glory comes and goes the year!
The buds of Spring, those beautiful harbingers
Of sunny skies and cloudless times, enjoy
Life's newness, and earth's garniture spread out,—
And when the silver habit of the clouds
Comes down upon the Autumn sun, and with
A sober gladness the old year takes up
His bright inheritance of golden fruits,
A pomp and pageant fill the splendid scene."

But a strong element of beauty in this great autumnal pageant would be missing if the Golden-rods were removed. The species here described, *Solidago stricta*, takes its place in the lower levels near the sea-coast, where the autumnal beauty is of a very different character from that in the higher elevations, or more northern regions. In what are known as the marshes of Southern New Jersey, the Salicornias and other Chenopodiaceous plants make a brilliant show of reddish brown. But there are purple Asters and deep yellow Golden-rods to give a great variety of tints. Meeting these on rather drier, but still level sandy spots, the slender Golden-rod here illustrated takes its place. The author has a beautiful picture in mind, from the original of which the drawing was made. It was quite late in October,—so late that the root-leaves (Fig. 1) were commencing to decay. A yellow tinge had settled on their tips, but the spike of flowers (Fig. 2) was only just in its prime. It is probably the latest to bloom of any species extending so far north. It was not exactly a "pine" barren, but an open grassy plain. The grasses were chiefly species of *Andropogon*. The comparatively dwarf *Helianthus angustifolius* had a good space, and showed off its orange-colored blossoms to great advantage; while the bright blue bells of the narrow-leaved Gentian were in the greatest abundance. The rocks and hills, with the undulating contours of surface, among which other species set off their beauty in more northern localities, was certainly wanting; but for all the special beauty of this autumnal scene made a deep and lasting impression on the memory.

EXPLANATION OF THE PLATE.—The plant obtained from Southern New Jersey. 1. A pair of root-leaves. 2. Upper portion of the flower spike. 3. Complete floret, very much enlarged.

WILD FLOWERS AND NATURE.

THE GENTIAN BY THE BROOK.

"We sauntered, full of thoughts of that which was,
And that which ought to be, and scarcely saw
The mighty vistas down the river dim,
Or the blue-budded gentian by the brook,
Amid our earnest parley."

—HOWARD WORCESTER GILBERT.

THE PLEASURES OF WILD NATURE.—A correspondent says: "Out of the many occupations, pleasures, fads and fancies of the present day, few occupy space in a greater number of hearts than those connected with Nature. And, indeed, what other is more entitled to rank so highly in public estimation and love,—the mysterious beauties of creation, everywhere abounding and affording the greatest possibilities for research and pleasure. Always new surprises at every turn,—no one can read the depths of wonderful Nature.

We delight in the beautiful and mysterious, and all pertaining to natural life. What is more engaging than a stroll through natural woodlands; the mighty trees swaying overhead in the breezes; the brooks rippling joyously along through the glades, here and there forming cascades resounding in romantic music, touching the very depths of the heart; the birds twittering and fluttering gaily about; the wild flowers, peeping out in modest beauty, and surprising the stroller at unexpected turns. And then beautiful spring, when trees and flowers awake, putting forth their leaves and buds, the birds return to their summer haunts, and the thrill of renewed life and vigor is given to all. To those who are denied the advantages of this out-of-doors life, other opportunities are given. The poorest hovel may contain window plants, beautiful in leaf or flower, and filling the rooms with the wonderful perfumes with which they are endowed, and brightening many a home otherwise neglected,—tenderly cared for as does a mother with her children.

To no one therefore is denied the great privilege of enjoying the great benefits of these natural gifts, and those who may not have accepted these opportunities, could find that they have missed much in refusing the gifts Nature has placed at their disposal."

HEATHER IN AMERICA.—The current number of MEEHANS' MONTHLY, a publication devoted to general gardening and wild flowers, contains an interesting article, with illustration, on the subject of "*Calluna vulgaris*," or common heather, which, it appears, there is now a disposition to claim as a plant indigenous to the New World. The writer of the article, who we have some reason for thinking is a Scotchman, confesses his doubts on this point, and in fact goes so far as to express the belief that it is more properly to be regarded as a waif from across the Atlantic; but on the other hand he is confronted by the fact that Dr. Asa Gray and other eminent botanists have admitted it among native American plants, and as it will probably for all time appear as such in their works he is forced to the conclusion that it is almost hopeless to contest the claims. He then proceeds to descant both learnedly and lovingly on the heather of the Old World, showing that it has entered into English literature to an extent not equalled by even the rose or the violet, and touching on some of the associations which make it peculiarly dear to emigrants from the "Land of Cakes." Regarding its history in this country he refers to the poet Percival's allusion to it as a native of Vermont only to prove that that was due simply to the poet's license, the introduction of the word being necessitated by the requirements of rhyme. About the middle of the century, however, he adds, a few plants were undoubtedly found in a bog about twenty miles from Boston, and gave an excuse to Whittier to introduce some beautiful lines in his "Ode to Burns." Since its first discovery in Massachusetts the plant has grown so much that it threatens to destroy some cranberry plantations; but for the fact that it has not done

so long ago is regarded by the writer of the article as an evidence that it is not a genuine native. Near Egg Harbor City, N. J., there are also some famous plants of heather, but these have had their origin traced back to the time when an exotic plant was introduced. Americans have shown their love for our games (from rounders to golf), until they have come to regard them as peculiarly their own. They have also sought to make common property of some of our most popular Scottish songs. It will, however, be necessary for them to adduce better proofs than they have yet done before they succeed in depriving Auld Scotia of her claim to be regarded as the real home of the heather.—*Scottish-American.*

FERTILIZATION IN THE GOLDEN RODS.—The meaning of the several behaviors of plants has attracted attention in recent times. The lobes of the pistil in the golden-rods have a papillose or brush-like character. Mr. J. S. Chamberlain, in the eighteenth volume of the "Bulletin of the Torrey Botanical Club," remarks that "the function of these brush-hairs is to thrust out and collect the pollen from the anther-tube." That this is the result is certain, but it is not clear that this is their special use. It is rare that any particular arrangement in nature is for any one particular function alone. So far as the good of the plant or its race is concerned, there seems no particular advantage gained by collecting the pollen in this manner, and this leaves the inference that the leading object to be gained by the collection has not yet been positively determined.

CONDITIONS FOR FUNGUS GROWTHS.—The chapter on the nice conditions, or we might say combination of nice conditions, required before mushroom spawn will grow, as noted recently in MEEHANS' MONTHLY, has been widely copied, and variously commented on. It is remarkable that this knowledge is not more universal, as the same law can be seen in operation everywhere about us. Numerous diseases spring from invisible members of the fungus family. The terms, bacillus and microbe, that everyone is now so familiar with, simply represent a low order of cryptogamic growth, which we may as well call funguses. Of these low orders of vegetation that can be well seen by microscopes only, over forty thousand have already been described and named. But these, like the mushroom, will only develop to a growing condition when the nice combination occurs. The pathologist calls these growing plants germs, but they understand by this that they are the germs of disease. What the botanist terms the germs of the plant, and the physician the germs of disease are two very different things. In the eye of the botanist, the most minute of these organisms, though composed of but a single cell, springs from a germ which he calls a spore. It is only after these spores have developed and become living plants that they become the germ of the pathologist. It is only after this growing cell increases in immense numbers that they concern the pathologist. In their truly germic stage they are wholly harmless. It is safe to say that animal organisms are taking in with every breath or with every mouthful of food or drink, spores of yellow fever, typhoid fever, diphtheria, small pox and many other dreadful diseases, which spores abound in the atmosphere and everywhere at all times. But the proper condition of temperature, food, and other circumstances which are necessary for their development do not exist for them, and they pass through the lungs or the bowels wholly unchanged. It is the want of this knowledge that makes the various public bodies known as Boards of Health so expensively tyrannical as at times to tempt the legislative bodies to wipe them out wholly in spite of the limited amount of good they certainly do. When the diseases die out for lack of the nice food required by the little vegetable organisms, the credit is given to the health authorities; and thousands of dollars are demanded to extend the work by them that should be credited to nature.

An apt illustration is now before the writer of this. It is a field, once cultivated but now abandoned. Among other vegetable occupants of the waste is a patch of many hundreds of square feet of dewberries and the common blackberry mixed. The dewberry is so completely covered by a species of blackberry rust that one might take it to be a patch covered with gold dust spread out to dry. But not one leaf of the common blackberry has a spot of rust. All as healthy as health could show. Now the dewberry and blackberry are so closely allied that in some of the variations a botanist can scarcely tell to which species to refer a given form. If we chew the leaves or stems, test the plants by smell, or eat blindfolded the fruit of either, we can detect no difference. But this little fungus knows. The spore, floating in the atmosphere, rests on the blackberry leaf as well as on the dewberry leaf, but it meets with something we cannot detect on the blackberryleaf that forbids its development. After awhile, however, some other species of rust, with its spore floating in the atmosphere, meets the blackberry plant. It has its desires, and then we have blackberry rust.

And thus it is with many things. Out of these forty thousand minute organisms a dozen or so have been found dangerous to human life. But as Providence has not enabled us to see them with the naked eye, and protect ourselves as we might from wolves or snakes, it has wisely arranged to protect us directly by ordaining that the conditions for their actual development shall be so rare that we are just as safe as if we could use knife or gun on them.

NATIVE ORCHIDS.—A correspondent from Milwaukee, Wisconsin, observes: "I noticed, with surprise, that a correspondent in a recent number of the MONTHLY, reports *Cypripedium acaule* as growing in dry oakwoods. The only places where I have found it here are tamarack swamps, where it grows in the wet sphagnum, together with *C. arietinum*, *Pogonia ophioglossoides*, *Arethusa bulbosa and Calopogon pulchellus*. I was out recently but found *Arethusa* very scarce, where they were plentiful a year ago. Many *Cypripedium pubescens* were found with blighted buds. Both circumstances, I presume, are due to the intense cold of last winter, as also the fact that I found no flowering specimen among some 25 or 30 specimens of *Orchis spectabilis*, which I examined recently."

GEOGRAPHY OF THE CRANBERRY.—I send you a specimen of *Vaccinium macrocarpon*, Ait, collected June 22, 1899, in a meadow near Mt. Gretna Park, Lebanon County, Pa. In 1893, I collected it at the same place; and, in June, 1892, in a meadow near Beartown, Lancaster County, Pa. I sent specimens from both localities to Prof. Coville, at Washington, D. C., who informed me that they had not been reported to him from those localities. They used to grow in a meadow in Chester County, Pa., and I find you have figured and reported a specimen of it from Germantown. Could they be cultivated and made profitable by covering them with sand? Do you know of any other localities in Pennsylvania in which they grow? AMELIA F. EBY.
Lancaster, Pa.

The above letter was not intended for publication, but it is presented because of the opportunity of a note on the growing importance of geographical botany.

Long in the past, before the glacial epoch—probably before man made his appearance on the earth—the Delaware River ran on the west side of what is now Philadelphia. Dammed up in its course by the melting ice, it forced for itself a new channel at the Delaware Water Gap, and struck out the course as it is now, on the eastern line of Philadelphia. Geology, especially through the labors of the late Professor Carville Lewis, presents this to us as a fact. To do this it would have to leave on its western bank, a strip of territory that we should now call a part of New Jersey, but for this departure of the stream. Now botany confirms this geological proposition. The flora of New Jersey is of a distinct type from that of Pennsylvania. This is especially noted in what are known as companion plants. Numerous species are found in close relation to each other, that are anything but neighbors elsewhere. This readily recognized New Jersey flora exists to-day on this strip that we are told formed part of ancient New Jersey, thus confirming the position geology has occupied.

When the writer first settled near the Germantown cranberry patch, the facts proved it to be originally of New Jersey. We see how botany aids geology in tracking ancient river beds. But this illustration does more. It is believed that plants change through the ages, and become new species by gradual modification. Just how many ages are required to effect a material change, has not been ventured on. It is clear, however, from this exact co-relation of the plants of this cut-off, with those of the mainland, that there has been no change since the glacial epoch. Mrs. Eby's plant shows it to be possibly the most eastwardly aboriginal station for the plants.

GENERAL GARDENING.

THE MOUNTAIN ASH.

The Mountain Ash
No eye can overlook, when, mid a grove
Of yet unfaded trees, she lifts her head,
Deck'd with autumnal berries that outshine
Spring's richest blossoms.
—ANONYMOUS.

AMERICAN FORESTRY.—In the June number of your very valuable magazine, a correspondent is desirous to know of the art of American Forestry, and how it can be made a "nest egg" for his declining years. Alow me, please, if space permits, to answer, in a general way, this momentous question, as I understand the subject from practical observation. The art of American Forestry, as practiced, consists simply in annihilating, radically, all woodlands, without renewal of corresponding areas. What is left to chance to grow up again as sprout-land, is without systematic effort or order. That the coming generations will severely suffer, and the whole country be put in danger of the fury of the uncontrollable elements, while the protecting forests fail, seems no concern of the single individual. To create forests, demands centuries of time; to use judiciously the existing ones, common sense and reason are great factors for their protection if applied.

With no forest schools, no practical instruction in forest management at our colleges or universities, the art of forestry will yet remain, for a long time, an unknown but eminently necessary duty for every person interested in the well-fare of this country.

Japan has long ago—more than twenty years at least—sent its brightest youths to Germany for the practical study of forestry, as it is there scientifically taught in all its branches. There, the forest lands are systematically regulated and always made a source of revenue, without diminishing the area or the product of it. If always the best trees are cut for use in a woods, the danger is that, if the stumps are left for reproduction, they cannot attain, in so short a time as is given to them, a useful size for general purposes. We do not understand, here, the national use of forest lands; neither does the farmer realize that the poorest land, if sowed or planted to forest growth, will bring surely the best returns if he can afford to wait for it.

Long before the Anglo-Saxons left Germany, the forest lands were then existing, in which the Druids held their heathen worship with the Pagan people. These same forests are in existence to-day. The smallest hamlet has a forest, for use of the people, under regulations which protect its existence. How forestry is organized by the respective City on Municipal government, may perhaps interest your readers, and to hear of a certain example with which I am perfectly acquainted, it being my native place. Parchim, in Mecklenburg-Schwerin, has about 10,000 inhabitants and a land area of about 2,396,000 square rods of the city proper and fields, gardens, meadows and moors, etc. There is also a forest area of 1,290,000 rods. It also owns 14 villages, which all have their separate forests besides their lands, combining a village, area of 2,365,581 square rods.

The income of the city is (I give it in a round sum, as space does not permit a specified account) $52,370. The cost of the city is $43,826. I will give only a few remarkable items :

Income from rent of lands,	$ 4,000
From meadows and gardens,	4,500
Hunting permits,	500
Forest income,	10,800
From the villages,	13,500
From sheep pasture,	700
City taxes,	2,800 etc,

Perhaps after all this is not a subject for your magazine, but as I have commenced I think it will personally interest you, and therefore I beg leave to add only a few more facts. The cost of the government is in their diverse main items. Salary of officials, $12,-683. High School, $2,108. As a help, all school expenses are borne by the parents, individually, who send their children to school, where attendance is compulsory, in either public or private schools.

Street lights,	$1,296
Night Watchmen,	800
Pavement of streets,	1,000
Repairing roads,	400

The Municipal Government consists of two Burgomasters, they must be first-class jurists to be able to administer the laws of the city as judges in the different courts. Also, the senior Burgomaster has to attend to the Lantag or Legislature of the States as a member. Two Senators, one of them a lawyer or jurist, the other a practical engineer and surveyor, direct all work in field and forests. The City Council is of 36 members, with a President. Of these, six serve in the Field Department, six in the Forest Department, and so all have their stated duties, which for a term of six years they must perform as citizens. The city owns a number of horses and wagons for the members of the field and forest department, who must personally supervise all work to be done, such as mark the tress and select them for cutting (the big ones). They direct the certain areas where the younger forest growth and new seeded lands have to be thinned out, etc. Little drops of water form the great ocean. May my few remarks give a vague idea how, in a Monarchial country, the rights and interests of the people are taken care of, which in many cases is to be recommended for imitation here.

MRS. WILHELMINE SELIGER.

Hartford, Conn.

The so-called science of political economy is so bound up in the question of forestry that Mrs. Seliger may well be pardoned for the wide latitude covered in her very interesting article. As she well shows, forestry is one of the few institutions that thrive well under a monarchial system of government, and this of itself is one of the difficulties in making the art of forestry find a home with us. But no system claims every good thing.

THE GYPSY MOTH.—I notice in the MONTHLY for July, page 103, second column, 5th line, an apparent confusion of dates. The date there given should probably be 1889 instead of 1869. On the next page, at bottom of second column, I fail to see how, unless more than one female deposites eggs in the same cluster, "about 1,000 caterpillars" can be produced from the "450 to 600" eggs that one female deposits. G. G. B.

Oklahoma.

TWO CHRYSANTHEMUM FAVORITES.— It is no wonder that one is thrown into confusion when he attempts to select a few chrysanthemum varieties upon being confronted with a list of perhaps 3,000 kinds. In 1896, the "American Florists' Directory" listed about 2,700 varieties, and this has been largely added to in recent years.

The annual chrysanthemum exhibitions held in most large cities are helps toward selection if the individuals be noted, though frequent unnamed exhibits greatly interfere.

Those who are fond of oddities and extreme variations will find it easy to choose; others may like their attention directed to certain choice kinds. One that is sure to please is Mrs. Perrin, a Japanese with bright rose pink, incurved petals. It is an exquisite shade of color. Mrs. H. McK. Twombley, of the same type, is a good white, shaded pink.

SHEARING TREES AND SHRUBS.—The annual winter shearing of trees and shrubs, so painfully evident in most parts of our country, the only good thing in connection with which is that it furnishes bread to poor men who might otherwise starve, seems not to be confined to this side of the Atlantic. Horticultural papers complain bitterly of the prevalence of the practice in England, notwithstanding true horticultural knowledge is supposed to be so widely disseminated there.

YELLOW CARNATIONS. — If the writer's memory serves him correctly, it was the Buttercup Carnation that first encouraged the production of yellow-varieties. The flower itself was good, but unfortunately too many buds were produced on each stem. Since then, there have been improvements, until now we have, among several good ones, Eldorado, Mayor Pingree and Gold Nugget. They are all three good, Eldorado perhaps the best, though the

others are still comparatively new. Pingree is a lighter yellow than Nugget and of a somewhat different type. Eldorado is daintily striped with carmine.

Borers in the Norway Spruce.—A western Pennsylvania correspondent sends us samples of two-year old branches of Norway Spruce, in which the centres are bored up and down by the larvæ of a beetle. There is scarcely any kind of tree that is not liable to the attack of some boring insect, and the cultivator, ever since the curse in Eden, has to use the sweat of his brow to keep them down. The larvæ were still at work on the date received, June 28th, and the puncture where the egg was deposited could be plainly seen. If, therefore, an examination of the plants are made early in June, and the infested branches cut off and burned, trouble could be averted.

Gardening and Old Age.—With business cares, the comparatively young may be excused for but little attention to gardening. But love for it should never die. It is the best investment for a happy old age. Everywhere around us we may see its evidence. When age brings relief from toil, nothing replaces busy life like a few hours in the garden. Our mail abounds with happy letters from garden lovers in old age. One remarks: "In my 77th year, I feel as young as ever in my garden."

Flowering Shrubs for Decoration Day in the West.—Decoration or Memorial Day, in most of the States about May 30th, is a happy time, though it is accompanied by sad memories of loved ones departed in battle and in peace. It is Dame Flora who makes it a happy time, without whom Memorial Day would soon become a thing of the past.

Above all things, we want an abundance of flowers at this time, and the question arises,—"what?"

A correspondent from Washington State asks for a suitable list for that section. As regards latitude, a list suitable for Maine should answer for Washington; but there are other considerations locally that may make a great difference between such widely-located points. Without referring to any positive records, it would be safe to say that the earliest spring flowers would be timely, such as Bridal Wreath Spiræa, Lilac, *Spiræa Van Houttei*, *Deutzia gracilis* and *Exochorda*.

Around Philadelphia, snowballs and weigela are looked upon as the principal flowers to be counted on in abundance; but this past season, they had just about finished blooming at the close of May, lilacs had disappeared long before; but in New York City, not much further north, lilacs were seen. The difficulty of providing a correct list for another State can, therefore, be recognized.

Paeonies and iris come in about the same time as the preceding, followed by deutzias and spiræas, other than those mentioned, and mock orange.

Longevity of Root-Fibres.—The *Botanical Gazette* says, "In the Wisconsin report for 1897-8, are important botanical studies by E. S. Goff. The first is an investigation of the resumption of root-growth in spring, showing that the rootlets of trees and shrubs do not die always during winter, as usually taught, but that growth is resumed in spring where it ceased in the previous autumn."

What Mr. Goff is opposing may be taught in colleges, but it never would be suggested by any practical and observing gardener. It has long been known that these fibres are annual. This was taught as early as 1853. Meehans' "Handbook of Ornamental Trees," says:—"There are two sets of roots to most trees, perhaps to all. One consists of fibres, the sole office of which is to draw matter from the soil for the use of the tree; the other of true roots, which extend and keep the tree in position, affording at the same time channels for the conveyance of the matter absorbed by the fibres. Fibres are annual, dying out after a season's service." This is very different from teaching that these fibres "die in the winter." They are needed in winter and spring possibly more than in any other season, to supply the evaporation which is as severe in cold weather, as the draft on transpiration is in the summer. In early fall planting, the success is dependent on a crop of new fibres sent out at that time, and in tree digging in spring the white tips are easily observed at the end of the fibres.

Fibres are annual. The exact period of their death has never been accurately determined, but it is probable that event happens about the time when a new crop appears from the main roots, which is about mid-summer. The main roots are fibres of more than usual vigor. These are a small percentage of the fibres formed. If a fibre gets through one year safely, it becomes a permanent root. This is the teaching that is practically taught.

Japanese Maples.—About 1858, the Meehan Nurseries received, from one of its Belgian correspondents, five plants of the Blood-leaved Japanese Maple. They were but three or four inches high, and appeared to have been raised from soft-wood cuttings. It was regarded as a special favor to get them, and the price for the five, twenty dollars, not thought unreasonable. They were potted in four-inch pots for a season. One was subsequently stolen—another was reserved to grow as a specimen and is still in existence on the grounds. The other three were grown for propagating purposes. All of the earlier distributions in our country, and until trade was opened with Japan, came from these three originals—the first 100 plants, about twelve inches high, being sold to a Boston dealer for $100. One of the successors to these early-raised plants is given in the illustration. It is growing on the grounds of ex-Councilman Mackie of Chestnut Hill, Philadelphia. It is given to show its habit of growth and adaptability to the ornamentation of small city yards and gardens. Its beautiful wine-colored foliage adds a charm to its habit of growth.

So far, what is written refers to the Blood-leaved variety, *Acer polymorphum atropurpureum*, or, as it is sometimes called, *Acer Japonicum atropurpureum*. Since our intercourse with Japan has become so close, there are numerous varieties of these dwarf maples, all so beautiful, that it would be difficult to decide which is the best. The blood-leaved, however, still holds its own in popularity, indeed, where only one plant is desired, it is the one selected for the start.

JAPANESE BLOOD-LEAVED MAPLE.

others are still comparatively new. Pingree is a lighter yellow than Nugget and of a somewhat different type. Eldorado is daintily striped with carmine.

Borers in the Norway Spruce.—A western Pennsylvania correspondent sends us samples of two-year old branches of Norway Spruce, in which the centres are bored up and down by the larvæ of a beetle. There is scarcely any kind of tree that is not liable to the attack of some boring insect, and the cultivator, ever since the curse in Eden, has to use the sweat of his brow to keep them down. The larvæ were still at work on the date received, June 28th, and the puncture where the egg was deposited could be plainly seen. If, therefore, an examination of the plants are made early in June, and the infested branches cut off and burned, trouble could be averted.

Gardening and Old Age.—With business cares, the comparatively young may be excused for but little attention to gardening. But love for it should never die. It is the best investment for a happy old age. Everywhere around us we may see its evidence. When age brings relief from toil, nothing replaces busy life like a few hours in the garden. Our mail abounds with happy letters from garden lovers in old age. One remarks: "In my 77th year, I feel as young as ever in my garden."

Flowering Shrubs for Decoration Day in the West.—Decoration or Memorial Day, in most of the States about May 30th, is a happy time, though it is accompanied by sad memories of loved ones departed in battle and in peace. It is Dame Flora who makes it a happy time, without whom Memorial Day would soon become a thing of the past.

Above all things, we want an abundance of flowers at this time, and the question arises,—"what?"

A correspondent from Washington State asks for a suitable list for that section. As regards latitude, a list suitable for Maine should answer for Washington; but there are other considerations locally that may make a great difference between such widely-located points. Without referring to any positive records, it would be safe to say that the earliest spring flowers would be timely, such as Bridal Wreath Spiræa, Lilac, *Spiræa Van Houttei*, *Deutzia gracilis* and *Exochorda*.

Around Philadelphia, snowballs and weigela are looked upon as the principal flowers to be counted on in abundance; but this past season, they had just about finished blooming at the close of May, lilacs had disappeared long before; but in New York City, not much further north, lilacs were seen. The difficulty of providing a correct list for another State can, therefore, be recognized.

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JAPANESE BLOOD-LEAVED MAPLE.

INTENTIONAL SECOND EXPOSURE

NEW OR RARE PLANTS.

THE HAZEL-LEAVED WYCH HAZEL.—*Corylopsis spicata*. The Wych Hazels form a rather small natural order, of which our common *Hamamelis* is the type. The order is known as *Hamamelidaceæ*. The Wych Hazel is always interesting from the fact that the while the fruit is ripening as winter approaches, the flowers for the next year's crop appears.

Japan and Northern Asia have a good representative in the order by a genus of some half a dozen species, known as *Corylopsis*,—literally

CORYLOPSIS SPICATA.

plants "like the hazel." This refers to the foliage and habit of the shrub, which has very much the appearance of a hazel bush. It would seem as if the botanist who first distinguished our Hamamelis as resembling the Wych Elm in foliage, had suggested to the other who named this genus, to name it from the suggestive Hazel bush. The spikes of yellow flowers curving gracefully in the spring, before the frost has fairly gone away, make the shrub very desirable for ornamental grounds. Like other Japan plants, it thrives nobly in American gardens. It has been growing for some years past in the choice collections of the United States, and is now attracting attention in Europe. The "London Gardeners' Chronicle," has recently drawn special attention to it, and it is from the pages of our excellent contemporary that we have transferred the illustration.

HOVENIA DULCIS.—Mr. Theo. D. Rand, Radnor, Pa., sends flowering specimens of this Asiatic tree of comparatively recent introduction. It has flowered in the Meehan nurseries for several years past, and we believe it has also bloomed for some seasons past in the vicinity of Baltimore. The flowers are in greenish-white clusters, resembling, somewhat, a bunch of Elder blossoms, and are slightly fragrant. But it is of the Rhamnaceous, or Buckthorn family. It is a middle-sized tree, with what might be termed an apple-tree growth. Its fine, glossy leaves are attractive. A remarkable feature is, that after blooming, the pedicels or flower stalks become succulent, and, when mature, resemble bunches of coral or sea-weed of a pinkish color. These are sweet as licorice. The specific name, *dulcis*, is derived from this fact. It is said to be a profitable item on Chinese fruit stands.

THE HARDY FLOWER GARDEN.

SIBERIAN IRIS.—As a class, the Siberian Iris have never been very popular, though there is really nothing objectionable about them. Their fault lies, no doubt, in small flowers. On the other hand, being taller than most other iris, they will frequently be found very useful. But there is one variety, *Orientalis*, which is truly excellent, and invariably pleases. To begin with, the unopened buds are dark reddish-blue, cropping out from amongst the leaves which are almost the same height. The flower appears late, and is a dark rich blue. It has rather narrow foliage, like the type, and is a neat grower.

PÆONIA.—In our grandmother's gardens, Pæonies—"pinys," the good dames called them—found a prominent place. And no wonder, for it is one of those pretty things that grow in beauty from year to year. It might

be a boast in one quarter that her "piny" had twenty flowers on, but she was only to be dumbfounded at the assertion that in a neighboring garden was a plant with thirty. But a plant would have to be grown a number of years, without removal, to have a claim to these figures. Annexed is an illustration of a noble specimen, growing in the Central Experimental Farms, Canada, which we have through the kindness of the director, Dr. William Saunders. It must have been a beautiful sight when in bloom. The handsome hedge of Hemlock Spruce, as a background, adds to the interest of the picture.

Most of the varieties under cultivation are from the Siberian species *P. officinalis*. The somewhat woody kinds, known as Moutans, are Chinese.

They thrive in any good garden soil, but have no objection to such ground as may receive an extra supply of good manure.

FRUITS AND VEGETABLES.

MUSHROOMS WITH TOMATO SAUCE.—The following recipe has been found so excellent that it is offered to the readers of the *Bulletin*. The mushrooms used were *Hypholoma sublateritium*, Schaeff, which is very abundant in late autumn about the base of old stumps throughout most of the Northern and Eastern States. Other species may do equally well, but those having a firm texture are best.

Take one quart of well-cleaned mushrooms, place over the fire in a stewpan. Let them

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come to a boil in their own juice, then add one cupful of tomatoes and one-half teaspoonful of mustard rubbed smooth in water. season well with salt and pepper, and cook well for half an hour. About five minutes before serving add a tablespoonful of butter. Serve hot, and you will find you have an appetizing dish.

This mushroom keeps well, prepared as above and placed in sealed vessels.

MRS. C. L. SHEAR,
in *Asa Gray Bulletin.*

POTATO BEETLE AND FRUIT-DESTROYING INSECTS.—Among insects worthy of mention, the Colorado Potato-bug, "*Colorado bugibus,*" (that's good Latin, is it not?) is very plentiful, not hurt in the least by the extreme cold of the past winter. I have read somewhere that this beetle chooses the weakest potato plant on which to deposit its eggs. This is all nonsense. This insect cares not where it places its eggs, nor on what substance, provided they are in easy distance of the potato vines. Their eggs are found on strong as well as the weak shoots, on stems and leaves of weeds or grass or dead sticks or straws. The Currant Worm was not hurt by that cold wave, either, as well as the mosquitos; and the young cut-worms are hatching out fast. As for the Curculio, I should not wonder that he will clean out the balance of the fruit which the cold in pity left for us. There will be only half a crop of strawberries, a few gooseberries, a few raspberries, blackberries and apples, and possibly a good crop of persimmons, are all we can count on this year; but grapes, somehow, are a standby. They are never killed or hurt to any appreciable extent. Grapes, we will have with us always; and they are always so plentiful that in their season they become an unsalable commodity. F. K. STEELE.

Festus, Jefferson Co., Mo.

SULPHUR FOR ROOT-FUNGUS.—Many trees and plants suffer from various species of microscopic funguses. Sulphur has long been known to be one of the best of remedies. Usually, one can tell that fungus is at work by the leaves being of a lighter color than normally. It is well to assume this to be the work of fungus, and to apply sulphur accordingly. For the potato scab-fungus, about 500 pounds to the acre may be employed.

RUSSIAN APPLES.—Wide-awake nurserymen and seedsmen, and live societies in which representatives of these classes take an active part, do not leave much of value for State or the National Governments to discover. This is also true of agricultural editors, and the conductors of live magazines. What they fail to tell their readers, is scarcely worth knowing. There is no more reason why governments should undertake to distribute agricultural seeds, and circulate freely agricultural magazines than that it should edit daily newspapers for the people. The writer of this has never taken strong ground against these practices, however, preferring to wait and see. Let a tree be judged by its fruits. One of these quixotic enterprises seemed to be the sending of an agent to Russia in search of fine Russian apples and other fruits. The nurseryman had been there generations before the agent. He had carefully gone over the whole subject, and with the exception of the Alexander and Red Astrachan,—not full Russians, by-the-way,—had found none worth listing in his catalogues. The agent, however, did his best. Numerous varieties were brought to America for trial. Now Mr. C. L. Watrous, of Iowa, tells us just what we already might have known, that "after ten years of extensive trial, it must be said that for the south half of Iowa, at least, the experiment with Russian fruit has been not only a disappointment, but a serious and costly failure. To recommend the extensive planting of these fruits in this district would now seem little less than criminal."

METHOD OF DRYING FIGS.—Fig-growing is not necessarily confined to southern districts, as MEEHANS' MONTHLY has frequently noted, and northern amateurs will consequently be glad of the following recipe, for drying the fruit, an extract from the *Florida Farmer and Fruit Grower:*

"Gather the figs when entirely ripe and partially dry them, so that they will not burst when pressed; then pack them in layers in a box; have a board fitting close on the inside on which place a weight, then keep them in a dry place until dry weather, when it will be found that sugar has been formed on the outside, and if well done they are in no respect inferior to the foreign article. This method is in very common use in California and is said never to fail when properly followed. It is a mistaken idea that figs and raisins are packed in sugar; they form their own sugar."

WM. BELT STRAWBERRY.—There are several strawberries of comparatively recent introduction which have gained a stronghold on popular favor, and are recommended in highest terms. While a good idea of the value of a berry cannot possibly be had from an illustration, yet the outline has some attraction, so Wm. Belt is here reproduced.

It is described as a luxuriant grower and remarkably productive. Flowers perfect; fruit

WM. BELT STRAWBERRY

large, glossy, bright red, and of good quality. Ripens about mid-season, and is considered excellent for the home garden.

THE TURNIP FLEA.—The turnip flea is still alive and shows this season that he has tastes for all sorts of meat, although Henbane, *Hyoscyamus niger*, is his favorite food. The leaves of young sugar corn he attacked this season, in force, causing the young plants to grow slowly, and the outer ends of the leaves to turn brown. I used a dilution of whale oil soap, but found that frequent stirring of the soil every day or two, and one or two visits a day and brushing them from the leaves, was of the most service. This insect is very fond of the tobacco leaves all through the growing season, from the small plants in the bed until frost comes in the fall. All plants of the nightshade family, this insect is found feeding on; and the egg plant, it is almost impossible to grow in this neighborhood without using Paris green freely. This insect cuts pin holes in the leaves and thus eats the poison and is killed. But eating corn is something new to me. Lately I have found out what is the food of the slug—his favorite food. The slug I have reference to is a snail without a shell and having protruding from his forward end two movable prongs with what seems to be eyes, which he has the power of telescoping to avoid obstructions in his way as he moves along on his greasy, glistening road. I caught the little black fellow eating the tender leaves of the tobacco plants. So he is a vegetarian. How can such a small mass of mucilaginous matter eat a plant? Has it teeth?

F. K. STEELE.

Festus, Jeff. Co., Mo., May 10, 1899.

FRUIT TREE BORERS.—Nearly all fruit trees are subject to attacks from stem-boring insects. In the orange, the attack may be anywhere between one and five feet from the ground. The larva is small, and the holes made are about the size of pin heads. No serious result follows from this insect's attack.

NEW CUCUMBER, "EXTRA LONG."—A new and very distinct cucumber is this season introduced by D. M. Ferry & Co., Detroit, Mich. Their description of it claims vigor, production and earliness. Fruit long, cylindrical, dark green, with very white, crisp and tender flesh. An excellent sort for culture under glass.

NEW PEACH, "WADDELL." When the famous peach grower and introducer of the variety Elberta, J. H. Hale, South Glastonbury, Conn., stakes his reputation in praise of a new peach, it may be considered as already having a good standing. Mr. Hale says: "Waddell is the largest, most beautiful, finest flavored, longest-keeping peach of its season yet tested. It is among the most hardy. A freestone of the North China type."

BIOGRAPHY AND LITERATURE.

NATURE'S PREACHING.

Your voiceless lips, O flowers, are living preachers,
Each cup a pulpit, and each leaf a book,
Supplying to my fancy numerous teachers,
From loneliest nook.

HORACE SMITH.

PHOTOGRAPHS.—The conductors of MEEHANS' MONTHLY are always grateful for good photographs of anything that will likely prove interesting to the readers of the magazine. At times, excellent photos are received but cannot be used at once, for reasons connected with the makeup; all, however, will appear in good time.

CHRYSANTHEMUMS.—"How to grow Chrysanthemums," is the title of a neat little 25-cent booklet, published by the American Gardening Co.

THE SYCAMORE TREE.—The Sycamore of Europe is a kind of maple called, by botanists, *Acer Pseudo-Platanus*, which means False Plane Tree.

In Egypt and Arabia, the Sycamore changes and takes the name of *Ficus Sycamorus*, which means, simply, Fig Mulberry Tree, because of the similarity of its leaves to that of the Black Mulberry. Like the False Plane-Maple, the Sycamore is a tall tree with thick trunk, having numerous branches, forming a large and thick head.

The leaves are heart-shape; the fruit resembles the common fig; firm, transparent and sweet flesh, of a yellowish white, inferior in quality to the common fig.

In the Scriptures is a story about this tree. Zaccheus, Chief of the Publicans, intermingled with the multitude on the day of the triumphant entrance of the Saviour into Jerusalem, and, that he might better see Jesus Christ, climbed a Sycamore Tree. The people cut off the branches of the trees and threw them in the road. It is in memory of this occasion, that the Church maintains the custom of blessing the branches of the Sycamore Tree.

It is also called Pharaoh's Fig. In remote times the wood was used for making vessels or coffins for mummies. One coming from Thebes was examined; its grain was very sound, not at all decayed; but it seems that the method used for preserving this wood was the same as that used for preserving the body, which was by the dryness and heat of the sand in that country.

The figs of the Sycamore are products largely used in Egypt, and formerly there were inspectors, called *Knaves*, who were charged with overseeing the harvests of this fruit. The common name, Sycophant, is derived from these inspectors.

SARAH D. LANNING.
Translated from *Lyon-Horticole*.

WEEDS.—The definition, originating with the senior conductor of the MONTHLY, that a weed is a plant growing where the cultivator does not want it, seems now generally accepted.

MOUNTAIN BEAUTY OR "ROSA DE MONTANA."—A European subscriber asks the botanical name of a vine catalogued as "Mountain Beauty." It is *Antigonon leptopus*, and has been a subject for discussion in previous pages of this current volume.

WASHINGTON THE BEAUTIFUL.—Under date of April 21st, the Washington correspondent of the Philadelphia *Public Ledger* says: "Washington is rapidly becoming the 'Place Beautiful' that it always is in the spring, though the season is fully three weeks later than usual. Crocuses, hyacinths and pansies make great patches of color in the parks; magnolias and fruit trees are in blossom and the tender green of the budding trees seems to envelop the avenues and streets in a delicate mist. Certainly Washington cannot be surpassed in loveliness by any city in the world at this season, for then it is that its 300 parks and circles bring the exquisite ethereal beauty of the springtime into the very heart of the city."

It should not be forgotten that the Nation owes this enviable picture of floral beauty primarily to the so-called "Boss Shepherd,"—and for the chief working out of the plan to the three "Parking Commissioners," Messrs. Wm. R. Smith, William Saunders, and John Saul, the two former of whom are still living to enjoy the results of their great labors,—for after all, this silent contemplation is about all the reward in the end that usually follows public usefulness.

NEW YORK BOTANICAL GARDEN.—Bulletin No. 4, of vol. 1st, shows the great Botanical Garden in Bronx Park, New York, to be in a condition of remarkable progress. It may well be termed "great," for it bids fair to rival some of the famous institutions of the Old World.

AUTHORS AND PLANT NAMES.—A correspondent inquires why the abbreviations of the names of botanists are usually placed after a plant's name,—and what is the object? He is in error in supposing that it is "usually" done,—that is to say, by people in general.

It serves no purpose whatever in any case but botanical monographs. In these cases, it serves good purposes—"Nutt.," for instance, meaning Nuttall, would indicate that the name used was given by Nuttall, and the reader could, if he desired, hunt up the works of Nuttall to find what he said about it. Occasionally, more than one species has received the same name, and the authors' names may settle a doubt as to the plant referred to. Outside of these strictly botanical papers, the use of an author's name after the botanical one should not be tolerated. The accepted name is all the general reader cares to know, or has any interest in knowing.

THE EARLIEST AMERICAN BOTANICAL GARDEN.—History records only that which is known, and, generally, only that which is known as being useful. In the history of American botanical gardens, that of John Bartram stands prominently forward, and is undoubtedly the first to be well worthy of the name. Plants from any part of the world were invited to a home there.

Possibly the earliest botanical garden in our country was founded by Kelpius, who established a monastery in the then wilderness of the Wissahickon, on what is now Monastery Lane, in the 21st Ward of the City of Philadelphia. He and a few others came to America and settled on this tract in 1700, one year before John Bartram was born. They were celibates, combined together to exercise piety, do good to humanity, and prepare for the second coming of Christ. They cleared the land and formed a fine garden, in which were cultivated plants, apparently keeping in mind such as could be applied to medical purposes. He was a man of profound learning, and he and his associates ministered freely both to the mental and bodily weaknesses of the community around them. It is recorded that when he was near his end, in 1708, he was carried out into the garden that he so much loved and expired there.

The garden's chief fame, however, was from the work of Dr. Christopher Witt, one of the younger brethren. After the death of Kelpius, the fraternity gradually pined away. Some of the individuals re-joining the world they had abjured, until Dr. Witt was the only one left. He died on Feb. 7th, 1765, and was buried in the monastery grounds. But Witt's Garden was the talk long after its great patron had gone back to the arms of. Mother Earth, and only the memory of his good deeds to suffering humanity remained. Local history says he was a pupil of the "eminent John Fabricius," but whether it was the great German entomologist, or the great theologian of the same name, is not clear.

LILIES.—With the May number of the *Botanical Gazette*, Prof. F. A. Waugh concludes a view of all the known species of lily. Gardeners have given botanical names to so large a number of forms, that Prof. Waugh has had some difficulty in listing these varietal names as separate from the accepted species. He describes 64 good species included in the genus, many of which are illustrated by wood cuts.

GENERAL NOTES.

THE UPHEAVAL IN PLANT NAMES.—"Professor Harms, in his pamphlet on nomenclature agitation during the latter years, compiled by request of the commission on nomenclature, refers in nine chapters to the lively agitation among botanists since the publication of Kuntze's work, 1891, and the numerous dissertations of the subject. As the views of the various writers are divergent, he compiles some of their most important expressions on the subject during the last few years. He, himself, does not express his own ideas, but refers to others—for instance, O. Kuntze, who advocates the necessity of unconditional adoption of the priority principle, and holds that this principle should be introduced into the nomenclature question to establish the mental property of "first discoverer or describer" of genera and species. He even demands this right to authors from a judicial standpoint. In America these views had already gained ground to some extent and Kuntze's labors were therefore received with approbation by many American botanists. Greene, F. V. Müller, LeJolis, and others, maintain the same opinion.

As the nomenclature agitation has not so far reached decided results, after many consultations and publications, von Wettestein proposes, as the best means to arrive at a conclusive end, an international botanists' congress to consider the ground features and reforms and eventually adopt the same. To facilitate this work he desires proposals, in writing, for the new laws for nomenclature, at least six months in advance of congress and to serve as basis for the dissertations. Kuntze sustains v. Wettstein in this proposal, advocating an international congress at Paris (or elsewhere), in 1900, and volunteers to act as general reporter, and besides promises to publish, not later than 1905, a corrected nomenclation for all plants, provided certain conditions are guaranteed him (cash ?), etc., etc."

The above translation, from a German source, so evidently means that the convention is not to be called to discuss the question without prejudice. It is to be called by those who have failed to convince botanists in general that it is wise to endeavor to upturn names of plants that have been accepted for half a century or more, and have become part of the general literature of the whole world. Such a convention would do little more than endeavor to prop a failing cause.

No one objects to the proposition that priority should have prevailed. But in the numerous cases complained of it did not prevail. It should have been the duty of those authors unjustly treated, to protest before so long a lapse of time. In all the affairs of every day life, there are limitations to actions for damages. This is common sense as well as law. The whole world that has accepted certain names of plants should not be put to no end of trouble, loss and confusion, because somebody blundered generations ago.

THE WEEPING DOGWOOD.—The weeping variety of the common Dogwood, *Cornus florida*, was found in a wood at Warren, Baltimore county, Maryland, in 1874, by Dr. W. S. Thompson, of that place.

STATE AIDS AGAINST INSECTS.—The State Assembly, of California, has appropriated $10,000 to send an entomologist to Australia to import such insects as will feed on such species as trouble the fruit grower.

THE WATER HYACINTH IN SOUTHERN WATER-WAYS.—There is much trouble with the Water Hyacinth impeding navigation in the St. John's River and other water-ways in the South. In the destruction of weeds that root in the mud and come to the surface, human invention has succeeded by the adaptation of a mowing machine that works under the water. In the case of the Water Hyacinth, which grows as it floats, something will surely be invented to overcome it before long.

MAMMILLARIA VIVIPARA

COLOR PLATE

MAMMILLARIA VIVIPARA.

VIVIPAROUS MAMMILLARIA.

NATURAL ORDER, CACTACEÆ

MAMILLARIA VIVIPARA, Haworth.—Simple or cæspitose; the almost terete tubercles bearing bundles of five to eight reddish-brown spines, surrounded by fifteen to twenty grayish ones in a single series, all straight and very rigid; flowers purple, with lance-subulate petals and fringed sepals; berry oval, green; seed pitted, light brown. Coulter's *Manual of the Botany of the Rocky Mountain Region.*

This very pretty member of the cactus family received the name it now bears from Adrian Hardy Haworth, a botanist who made a special study of succulent plants. He described this for the first time under the name of *Mamillaria*, in a work entitled *Supplementum Plantarum Succulentum*, published in London, in 1819. But the first author to bring it to the attention of botanists was the celebrated Nuttall. John Fraser made a collection of living plants and seeds in America, and collected this plant, introducing it to British gardens in 1811. A catalogue of Fraser's plants, prepared by Nuttall, was issued in 1813, in which our plant appears as *Cactus viviparus.* This is the date of its first appearance in published form. The full description appears in Nuttall's own work, "The Genera of North American Plants," still as *Cactus viviparus.* He says of it that it was found "on the high hills of the Missouri, probably to the mountains, flowering from June to August; flowers large and bright red, almost similar (in color, he means) to those of *Cactus flagelliformis.*" His description of the plant is interesting as showing that it is almost as characteristic as the more modern one of Prof. Coulter. "Cæspitose; glomeruli sub-globose; tubercles cylindric-ovate; bearded, marked above by a proliferous groove; flowers central, large and exserted; exterior segments of the calyx ciliate; fruit ficiform, greenish." He adds that it is "nearly allied to *Cactus mammillaris*, (now known as *Mammillaria Missouriensis*), but different, probably, from other species of this section by the remarkable proliferous tendency of its leaves, which not unfrequently multiply to the destruction of the parent plant. It consequently never becomes so large as *C. mammillaris.* Inhabiting a climate which is scarcely temperate, from the great elevation of the land above the level of the sea, it produces long and somewhat fusiform roots, penetrating deep into the earth. Towards the approach of winter, the upper part of the plant becomes dry, excessively spiny, and almost juiceless; in the spring, numerous shoots issue from the root and those glomeruli which have withstood the intensity of the frost. Thus the plants become cæspitose, forming masses, sometimes of two or three feet in breadth. In spite of its armature, the wild antelope of the plains finds means to render it subservient to its wants by cutting it up with his hooves. The flowers are generally central, more than an inch in length; segments of the calyx linear; exterior ones revolute, with a fringed margin; petals numerous, narrow, linear and acuminate; berry about the size of a grape, smooth, and eatable; seed small, cotyledons none (in the seeds which germinated with me, merely a tubercle similar to those of the parent plant)."

It may be remarked here that, up to this time the cactus family had not been divided into distinct genera as now,—though some sub-division was seen to be desirable, and these sub-divisions received Latin names.

The somewhat round plants were in one section and were named *Echinomelocacti;* those which were upright, and sufficiently strong to stand alone, were *Cerei;* those like the others in general character, but had to lie on the ground, were *Cerei repentes*, or creeping cereuses; while those with compressed-jointed fronds were classed as *Opuntiæ.* Nuttall's "Genera," issued in 1818, as already noted, followed this arrangement. The following

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COLOR PLATE
INTENTIONAL SECOND EXPOSURE

year, Haworth's work appeared, using the word *Mammillaris* to form his new genus *Mamillaria*. The word is derived from *Mamma*, a teat; but Haworth used but a single *m* in forming the word, and the spelling is at times retained as Haworth wrote it. Sometimes botanists agree to correct these manifest errors,—at other times the imperfect names are adopted. There seems no general rule in practice. In this chapter the orthography of *Index Kewensis* is followed.

The origin of the name *vivipara* can be gathered from Nuttall's account. The plant is often viviparous,—that is to say, bears buds from the apex of the mammæ, by which the plant is often increased. The author of this chapter has often met with the species in different parts of Colorado, but never saw it in the viviparous condition, or in the cæspitose state described by Nuttall. The stems or heads under his observation were often cylindrical, reaching, sometimes, a length of six inches or more, with a few smaller heads pushing out around the base. The specimen from which the painting was made, is one of these side branches, planted in the author's garden, and which has not had time to form the fusiform roots Nuttall describes, though some are evidently about assuming that condition.

The habit of the plant is, however, very changeable. Engelmann, describing the *Cactaceæ* collected during Emory's survey of the Mexican boundary, remarks on this variability, some of which he considers distinct enough to bear varietal names. One somewhat cylindrical and with but a few heads branching from the base, as the one figured in this chapter would ultimately do, he calls variety *radiosa*, though, in his time, found only in Northern New Mexico. Another variety he names *borealis*, collected in that period in Western Texas, which was ovate or sub-globose and but little branched. Another variety, *New-Mexicana*, was ovate or sub-cylindrical and usually much branched. Still another variety is termed *Texana*, quite a large form, from a tributary of the Guadalupe in Western Texas. All have some minor differences in the number of spines, and in other respects. But as he, himself, remarks in Bigelow's report on the survey of a route to the Pacific, "it is found in many different forms, from the plains of the Canadian, in longitude 100°, to the Aztec Mountains, in longitude 112° west. It occurs in the greatest variety of altitudes through twelve degrees of longitude. Specimens of it were collected on the top of the Sandia Mountains, near Albuquerque, upwards of 13,000 feet above the level of the sea, September 4th, 1853, to January 17th, 1854." In cultivation at Philadelphia, it commences to bloom about mid-summer, and produces the flowers, successively, for several weeks, the green, gooseberry-like fruit of the first flowers being mature before the flowering season is quite over.

One of the most interesting features in the history of the plant is its ability to endure a very low temperature, such as it meets with in the Rocky Mountains,—while the greater number of species, in the genus, die under a single degree of frost, and many fail under a low temperature, though above the freezing point. The species already known and described number over three hundred, and are found chiefly on the hot plains of Mexico. None are found outside of the New World. What has, in recent times, been termed the science of Ecology, or the study of the relations of plants to the conditions around them, affords no explanation why a few should have reached such a stage of exemption from injury by cold and the multitude fail. Supposing that a number of species in their warm Mexican home had advanced to the frost line, why not individuals of other species succeed in being "fit to survive" in the struggle with the frost king, as well as of the individuals that were the progenitors of *Mammillaria vivipara?* If we could look on plants as sentient beings, how puny the vast army of cactuses must have regarded themselves, when these little Davids alone were able to conquer the great giant against whom they were struggling! Possibly ecology may make this all clear to us some day, and then ecology will be a science indeed. In *Opuntia Rafinesquii* the water in the cells seems to recede into the intercellular species, and permits of contraction instead of expansion under frost, so as to resist North Atlantic winters,—and it is barely possible that some such process may be found acting in the case of the Rocky Mountain Mammillarias.

EXPLANATION OF THE PLATE.—Whole plant, of small size, originally from near Idaho Springs, Colorado.

WILD FLOWERS AND NATURE.

AUTUMN.

"Gayly chattering to the clattering
Of the brown nuts downward pattering,
Leap the squirrels, red and gray.
On the grass land, on the fallow,
Drop the apples, red and yellow,
Drop the russet pears and mellow,
Drop the red leaves all the day."

—WHITTIER.

LUMINOUS FLOWERS AND PLANTS.—Every one knows that certain insects are luminous; but it is not so well known that some plants and flowers produce phosphorescent lights. It was Linnæus who first made known this fact. He discovered it on a branch of common Capuchin. A Swedish naturalist, Haagren, afterwards made some observations on luminous plants, and stated that the phosphorus was produced after sunset, and ceased in rainy weather. The lights appeared generally in July and August, about half-an-hour after sunset. He examined the flowers through a microscope, to see if the phenomenon might not be due to the presence of insects, but found it to be attributable to the flowers alone. The leaves of the Capuchin were very bright, and the phenomenon very persistent even after separating the leaf from the plant. The Fraxinella throws quite an intense light over the other plants of the garden.

In tropical countries, quite a number of plants are luminous. The Meadow Lily, which grows in abundance in the marshes of Africa, is one of the most perfect types of vegetable phosphorescents. In Brazil, a kind of grass, which the inhabitants call *Khus-Khusshines*, gives forth a bright light, before which horses and other grazing animals stop in surprise and fear.

A certain Virgin vine, called in its country *Cypo*, lets fall a train of light like tears of fire the length of its stem.

Some ferns, mosses, and mushrooms are equally phosphorescent. In the charcoal mines in the environs of Dresden may be found a luminous fungus which carpets the wood and sides of springs. In France, it often covers the trunk of olive trees.

According to the experiments of several botanists, the phosphorescence of these fungi disappeared when they put them in a vacuum or even if they were shut up in carbonic acid gas.

We may conclude that the light emitted was due to a slow combustion of a particular substance existing in the tissues of the plant.

From *La Semaine Horticole*. Translated by S. M. LANNING.

NUT-GALLS.—Dr. C. W. Greene, Merchantville, New Jersey, says: "During a recent winter walk, I found many oaks, apparently the common Black Oak, whose smaller branches were covered with galls. If these galls were gathered in their green state, would they not be useful as nut-galls?"

The suggestion is worthy of the attention of those interested in the development of the economic products of our country. Surely among our many species of oak there should be some that would produce the useful nut-gall without our having to look to the gall-oak of the Old World to supply them.

APPEARANCE OF THE KATY-DID.—I am, this balmy evening, sitting near an open window, being amused by the Katy-dids' dispute. Ever since I have lived here, one member, or his legal successor, of this chattering tribe, has engaged a reserved seat in a neighboring oak, and occupies it with unusual regularity. My record extends only back as far as 1894, when he (or she) opened up the controversy August 1st. In '95 and '96, it was July 29th, but in 1897, my belated friend did not appear until August 3rd. but made it up this year by being on hand with his saw-mill July 29th. Our local paper notes the appearance of this prophet, and says, "look out for frost in six weeks,"– which is good advice to follow, merely to see how true or false one of the many sayings is. In 1894, frost did not come

until October 14th, or over ten weeks. In 1895, the conspiracy between Mrs. Katy-did and Jack Frost worked to a charm, as in six weeks, to a day, he came and did his work. In 1896, frost was eleven weeks in appearing. I have no record for 1897, but know that we had an unusually long fall, free from frost.

What is interesting to me, is the regularity in time of their appearance. My record gives dates of when I first heard them. Circumstances might be such that in 1897, they might have arrived a few days earlier and I not have noticed them. As to the frost question, I must confess to being situated within six hundred feet of Lake Michigan, on the east whose water level is ninety feet below me, and, on the west, my grounds are bordered by deep ravines. These lower levels naturally attract the lighter frosts, and, as a rule, the level lands, a mile or so west of me, are frosted much earlier than mine. W. C. EGAN.

Highland Park.

RETURN OF BIRDS.—Many persons believe that birds, returning to their summer quarters, are the same that were at the same spots the year previous; but exact proof is rare. Mr. John B. Crowson, of Germantown, Pa., saw a robin struggle to get free from some string in which it had got entangled, resulting in a broken leg. It was lame, accordingly. The lame bird returned year after year to the same spot. How they can retire hundreds of miles, and yet return to the same spot, is truly wonderful.

BEAUTIFUL WILD FLOWERS OF THE COLORADO MOUNTAINS.—Doctor Boynton, having ascended the Colorado Mountains to about fourteen thousand feet, remarked that the miners there, after becoming accustomed to the high altitude, seemed to work without discomfort, but added, "the first time a man finds himself at this height, he must move with great caution, or soon he will not move at all."

Further on, he says, that after the timber line ends, "all beyond is blank barrenness and gray desolation, save small tufts of stunted grass, and here and there a dwarfed shrub. But even here there is one redeeming feature in these otherwise desolate heights, and that is the profusion of wild flowers, which seem to flourish wherever there is the smallest bit of soil, and even to spring from clefts in the rocks where no soil at all can be seen. Though seemingly fragile and short-lived, typical emblems are they of the sweetest human lives and affections, which flourish to make existence endurable under the most bitter circumstances. Patches of blue and scarlet violets, tender buttercups and purple-petaled daisies look up and greet with a smile the man who has had the courage to climb these Alpine regions."

Then the author goes on to describe the view as one vast forest of mountain peaks, and calls the numerous pinnacles of Colorado the Milan of mountain cathedrals; and the glorious glow of the sunset clouds as beyond the power of language to describe.

The beauty of inanimate nature and the vastness of mountain scenery leads us to inquire if we alone of all the universe enjoy and understand it. Something akin to the awe that comes over us when looking at the planets, Saturn and its rings—because not events of daily occurrence like the blushes of Aurora, and yet—

"The daisy fresh from its winter sleep
Tells of God's power in lines as clear."

MRS. E. E. ORCUTT.

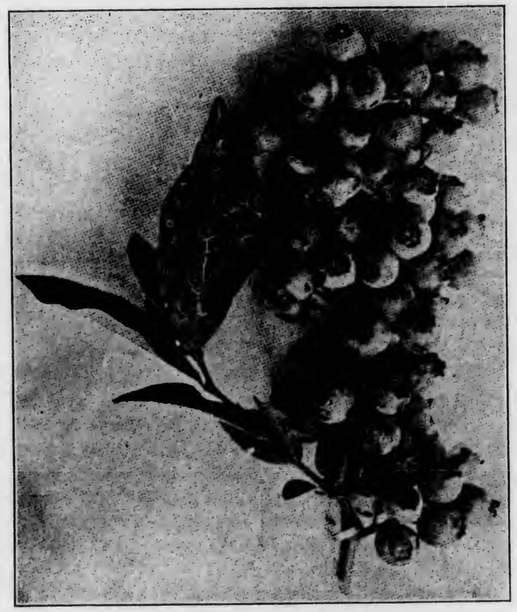
OUR NATIVE BIRDS.—The great series of North American birds, made by Mr. Josiah Hoopes, of West Chester, Pa., and numbering 7,250 specimens, has been secured by the Academy of Natural Sciences of Philadelphia, and added to its already unique collection. The number in the Academy is now 43,460. Mr. Hoopes has been long known as an able and enthusiastic horticulturist and botanist; but his ornithological accomplishments have not been a matter of such public record.

NATURE-GRAFTED LETTUCE.—Mrs. Edward Sayres sends a specimen of the common lettuce in which two leaves are united by the midribs, leaving the blades free. They are young leaves from the heart of the head. This union must have occurred in a very early stage, and probably before the parts could have been detected as distinct even by the aid of a powerful microscope. These cases are particularly instructive as showing that the general conception by close students of plant life, that the whole plan of the future plant is laid out in the early embryonic stages of life, is actually a fact. There can be no other explanation of this case of the united lettuce leaves.

MORPHOLOGY.—Mr. Warren P. Adams, Abington, Pa., says:—

"I send with this a *Vaccinium* that interested me, and may be new to you. The overgrown calyx and flower looks like the turnip flowers the Germans cut. You note that the most mature one is splitting up into leaves, a demonstration of Goethe's theory."

The poet Goethe was a great botanist, also, and was one of the chief founders of the very interesting department of the science of botany, known as vegetable morphology. By this is understood that every organ of a plant is but modified leaf-blade. As Dr. Lindley once expressively put it, a luscious peach is neither more nor less than a bundle of leaves. Facts, such as this presented by Mr. Adams, were what led Goethe to see the light. In this case, the flowers of *Vaccinium corymbosum* in an early stage were attacked by a fungus. This prevents the formation of berries as in the cut annexed,—and what should have become consolidated and succulent, continues as exaggerated leaves! even the stamens have become foliaceous so far as the filaments are concerned, though the anthers that the leafy filaments carry seem perfect.



VACCINIUM CORYMBOSUM.

These "freaks," as they were once termed, are now eagerly sought for by students of morphology. They are the keys with which nature's strong box of secrets are to be opened to the view of ardent explorers.

Aside from the intellectual study afforded by our correspondent's specimens, it might be well to add that material pleasures are equally involved by a study of this plant. It is one of the most valuable of the Huckleberry family. Appended is an illustration of a branch in fruit, from a photograph kindly presented by Mr. Luther Burbank, the well-known fruit improver, of Santa Rosa, California.

FLOWERS AND INSECTS.—Much discussion has arisen as to whether insects are attracted to flowers by color or fragrance. The truth is that both or either may be the attractive force. As noted by correspondents of MEEHANS' MONTHLY, honey or pollen-collecting insects come long distances to lindens, sumachs, and other plants with inconspicuous flowers,—but no doubt color has, in its own line, persuasive powers. The beautiful border flower, *Pardanthus Chinensis*, has no perceptible odor,—yet it is visited in large numbers by carrion flies, that within every huntsman's experience, must be guided mainly by the fetid odors of the substances to which they hurriedly flock when in reach of them. There seems to be nothing in these flowers, either as food or in any other way useful. The color and appearance of the flowers are highly suggestive of raw meat,—and unless we assume that the color has deceived the flies, there seems no way of accounting for their presence.

It really looks as if they were deceived, for they remain but a few moments on each flower, darting to others successively, only again to be tricked as one might imagine they were.

GENERAL GARDENING.

AUTUMN.

Comes next
  Brown autumn in her turn,
Oh! not unwelcome cometh she;
The parched earth luxuriously
  Drinks from her dewy urn.

And she hath flowers and fragrance, too,
  Peculiarly her own;
Asters of every hue-perfume,
Spices rich with Clematis and Broom,
  And Mignonette late blown.

—Mrs. Southey.

Second Blooming of Easter Lily.—The flower represented in the accompanying illustration is from a bulb of *Lilium Harrisi* that bore a stem about five feet high, with four flowers, which were open April 10th. The plant was placed on a north veranda, and watered a little from time to time, to encourage the development of the second stem that was appearing from the bulb. It grew slowly, but eventually showed a bud. The plant as shown was photographed on July 1st. The bud, just opening at that time, was 5⅜ inches long and the stem 10 inches high. This may frequently occur with this plant, but has not before come to the writer's notice. E. E. Bogue.

Stillwater, O. T.

The photograph shows a full formed flower on the top of the stem. It is unusual for lilies to behave in this way,—or, indeed, for any bulb,—though the hyacinth will occasionally have two flower-shoots from one bulb.

Drying of the Ground by Tree Roots.—A correspondent of *American Gardening* gives the following apt illustration of the drying of the ground by the roots of plants:—

"It is an undisputed fact that some plants require more moisture than others, and the gardener will profit by careful observation looking to a better arrangement of the garden and grounds to best withstand drouths. The writer was interested recently in noting how rapidly a row of radishes sucked up the moisture from the ground. The tops were too small to keep the soil from getting well soaked by a good rain, so the moisture was spread pretty evenly. In less than twenty-four hours, along the whole row, the soil was dry to a space of one and a half inches on either side."

Few lessons are more valuable to the practical man than that conveyed by the above paragraph. In our every-day work plants that love shade are planted near large trees, forgetting how the ground will be dried out by the tree roots.

In forestry articles, also, much stress is placed on the preservation of old forests on the ground that snow melts slowly under the shade of trees, and thus soaks into the ground, and supplies the springs, instead of melting rapidly in sunlight, and the water coursing to the streams. But the fact is, that, as a general thing, the water taken into the ground under forest trees is, in great measure, simply stored there for the use of trees in dry weather.

Thus we see that the simple story of a row of garden radishes has an influence on great problems.

The Ash as a Street Tree.—Maples, buttonwoods and poplars have become the staple street trees in many towns and cities. Their chief recommendation is that they grow fast, and can be raised and sold for low figures. But they soon become larger than the owner wants them. One can learn useful things from trees in public places. In Philadelphia the ash seems to be able to hold its own against all enemies. The true White Ash is the best,—the Red and Black do very well. The White is known by the very dark upper surface of the leaf.

Carolina Poplar.—The poplar, commonly known as Carolina, is sometimes designated as North Carolina and at others South Carolina, the impression being that there are two kinds. This mistake is but another instance of the ease with which names get altered. Someone once named it *Populus Caroliniensis*, and while the common name of Carolina has clung to it, it has been decided to be *P. monilifera*.

It is said to have been probably forty years since this poplar was introduced to general usage by a New Jersey nursery, finding favor because of its great rapidity of growth. While still very largely in use, people are rapidly beginning to appreciate the fact that rapidity of growth is not always the best character for a street shade tree, and trees of more beautiful and permanent character are being sought.

Aquatic Flower Culture.—It is nearly forty years since special attention was given to Water Lily culture, through the first flowering of the famous *Victoria regia* at Springbrook, the seat of Caleb Cope, near Philadelphia. It was thought to require special care and skill, and a costly house was built for its development, and a special structure with hot water appliance arranged to germinate the seeds. When, a year later, the beautiful pink Egyptian Lotus was brought to grow and flower in the open air, it was thought to be the opening of a new era in American gardening.

AQUATIC GARDENING.

Since then different cultivators have shown how simple and easy the culture can be made,—and some of the most beautiful effects in garden and park scenery are wrought through the agency of water lilies, and other aquatic plants.

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Destroying Trees and Vines.—A Chester County, Pennsylvania, correspondent has a fifteen-year old Osage Orange row, formerly a line fence dividing two fields, that he wants to destroy. It is a rule understood by all intelligent gardeners, that anything, even the persistent Poison Vine, can be destroyed readily by cutting down while the spring leaves are still immature,—say within three weeks of the bursting of the buds in spring. The Osage Orange could be no exception.

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GENERAL GARDENING.

AUTUMN.

Comes next
  Brown autumn in her turn,
Oh! not unwelcome cometh she;
The parched earth luxuriously
  Drinks from her dewy urn.

And she hath flowers and fragrance, too,
  Peculiarly her own;
Asters of every hue-perfume,
Spices rich with Clematis and Broom,
  And Mignonette late blown.

—Mrs. Southey.

——

Second Blooming of Easter Lily.—The flower represented in the accompanying illustration is from a bulb of *Lilium Harrisi* that bore a stem about five feet high, with four flowers, which were open April 10th. The plant was placed on a north veranda, and watered a little from time to time, to encourage the development of the second stem that was appearing from the bulb. It grew slowly, but eventually showed a bud. The plant as shown was photographed on July 1st. The bud, just opening at that time, was 5⅜ inches long and the stem 10 inches high. This may frequently occur with this plant, but has not before come to the writer's notice. E. E. Bogue.

Stillwater, O. T.

The photograph shows a full formed flower on the top of the stem. It is unusual for lilies to behave in this way,—or, indeed, for any bulb,—though the hyacinth will occasionally have two flower-shoots from one bulb.

——

Drying of the Ground by Tree Roots.—A correspondent of *American Gardening* gives the following apt illustration of the drying of the ground by the roots of plants:—

"It is an undisputed fact that some plants require more moisture than others, and the gardener will profit by careful observation looking to a better arrangement of the garden and grounds to best withstand drouths. The writer was interested recently in noting how rapidly a row of radishes sucked up the moisture from the ground. The tops were too small to keep the soil from getting well soaked by a good rain, so the moisture was spread pretty evenly. In less than twenty-four hours, along the whole row, the soil was dry to a space of one and a half inches on either side."

Few lessons are more valuable to the practical man than that conveyed by the above paragraph. In our every-day work plants that love shade are planted near large trees, forgetting how the ground will be dried out by the tree roots.

In forestry articles, also, much stress is placed on the preservation of old forests on the ground that snow melts slowly under the shade of trees, and thus soaks into the ground, and supplies the springs, instead of melting rapidly in sunlight, and the water coursing to the streams. But the fact is, that, as a general thing, the water taken into the ground under forest trees is, in great measure, simply stored there for the use of trees in dry weather.

Thus we see that the simple story of a row of garden radishes has an influence on great problems.

——

The Ash as a Street Tree.—Maples, buttonwoods and poplars have become the staple street trees in many towns and cities. Their chief recommendation is that they grow fast, and can be raised and sold for low figures. But they soon become larger than the owner wants them. One can learn useful things from trees in public places. In Philadelphia the ash seems to be able to hold its own against all enemies. The true White Ash is the best,—the Red and Black do very well. The White is known by the very dark upper surface of the leaf.

——

Carolina Poplar.—The poplar, commonly known as Carolina, is sometimes designated as North Carolina and at others South Carolina, the impression being that there are two kinds. This mistake is but another instance of the ease with which names get altered. Someone once named it *Populus Caroliniensis*, and while the common name of Carolina has clung to it, it has been decided to be *P. monilifera*.

It is said to have been probably forty years since this poplar was introduced to general usage by a New Jersey nursery, finding favor because of its great rapidity of growth. While still very largely in use, people are rapidly beginning to appreciate the fact that rapidity of growth is not always the best character for a street shade tree, and trees of more beautiful and permanent character are being sought.

——

Aquatic Flower Culture.—It is nearly forty years since special attention was given to Water Lily culture, through the first flowering of the famous *Victoria regia* at Springbrook, the seat of Caleb Cope, near Philadelphia. It was thought to require special care and skill, and a costly house was built for its development, and a special structure with hot water appliance arranged to germinate the seeds. When, a year later, the beautiful pink Egyptian Lotus was brought to grow and flower in the open air, it was thought to be the opening of a new era in American gardening.

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Hybridizing Bulbs.—Mr. Oberwetter, of Austin, Texas, succeeded a few years ago in obtaining a cross between two distinct genera of bulbs. In reply to an inquiry as to final results, Mr. O. replies:—

INTENTIONAL SECOND EXPOSURE

"The hybrid plant between *Crinum* and *Hippeastrum*, raised nine years ago, I lost, perhaps by mismanagement. It grew splendidly till July or August, when one of the leaves began to rot at the top. I cut it off to prevent the rot spreading further; but one after the other the leaves died in the same way. During winter I kept the plant dry and as warm as possible; but in March, from anxiety to see the plant grow again, I watered it with warm water, but the little bulb became smaller always and never made an effort to grow again."

The thought occurs that a lessened vital power to resist fungus attacks may often lead to failures such as Mr. O. met with. A few years ago, the writer crossed a flower of *Rosa rugosa* with pollen of General Jacqueminot. Only two plants grew from this one seed-vessel. One was strong and vigorous, and was *Rosa rugosa* pure and simple,—the other had every appearance of the General Jacqueminot. This last, however, was attacked by a fungus parasite, and, in spite of all efforts to save it, it dwindled and died before flowering.

NEW OR RARE PLANTS.

ALLAMANDA SCHOTTII.—A vigorous specimen of *Allamanda*, in the full glory of its yellow bloom, is a sight not easily forgotten. The species *Schottii* is a very free bloomer, and its bunches of funnel-shaped flowers contrast well with the whorled, evergreen leaves. These flowers greatly resemble, in size and shape, the well-known Trumpet Vine flower, *Bignonia*, being also arranged in terminal bunches whose individuals open in successions of two or three; but in examining a specimen recently, it occurred to the writer that the lobes of the five-cleft corolla over-lapped each other more than do those of the bignonia, and were, therefore, more effective. The flowers are bright yellow in color with a brown striped throat. The specimen referred to is standing at the end of a rose house, trained closely to the glass, where it receives full benefit of light and heat, which it well appreciates. Being a rather graceful climber, – or runner,—it is readily placed to occupy but little room in the house. Flowers are borne on the growth of the same year, so a close pruning is very desirable; two or three buds are sufficient to leave in pruning. Unlike most plants, the Allamanda seems willing to do double duty, as it may be trained on a wall or porch for summer flowering, continuing to bloom in the winter after removal to the house, always retained in a tub for convenience. Doubtless pruning when the transfer is made, furnishes a certain amount of rest, making the apparent reversal of custom more clear. Water should be plentifully supplied when the plants are growing, and for this reason the tub should not be completely filled with the soil; for the same reason, a light compost of sand, peat or leaf-mold is desirable.

The general appearance of the Allamanda would not lead one to the fact of its belonging to the same family as the oleander, which is in the Natural Order *Apocynaceæ*. The leaves, contrary to the oleander, are rather broad or oblong and not erect, though both are equally ornamental in their place.

This plant, with so many merits, should be more extensively cultivated, as it is said to propagate very easily from cuttings placed in a bottom heat of from 75 to 80 degrees. There are eight or ten species, yellow being the predominating color of the flowers, and doubtless many of them would prove equally as desirable as *Schottii*.

ACALYPHA SANDERI. — This has recently been figured as No. 7632 in the *Botanical Magazine*. Referring to this, the *Gardeners' Chronicle* says :—

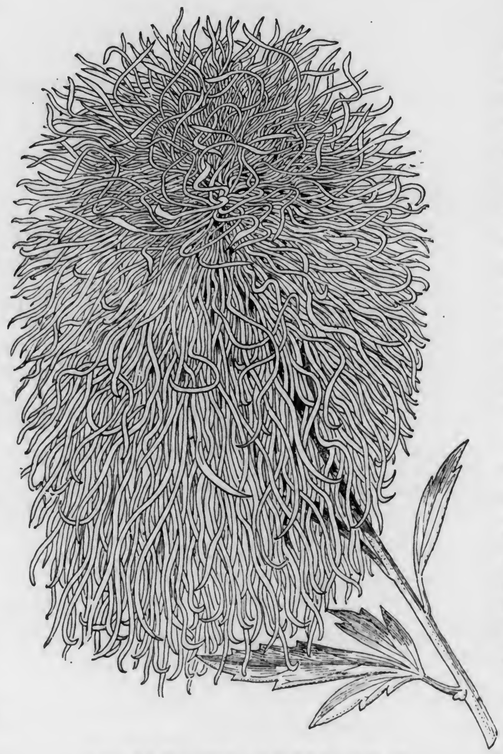
"*Acalypha hispida*, Burmann.—This is the very remarkable and ornamental plant described in our columns in 1896 as *A. Sanderi*, which name we expect it will still bear in gardens. It appears that *A. hispida* has not until now been met with in a wild state, the plant figured and described in old books relating to Malayan botany being cultivated only. Messrs. Sander & Co. received their plants from the islands of the Bismarck Archipelago, where it was found by Micholitz. At present, only the female plant is in cultivation, and its long, pendulous, crimson spikes are produced throughout the entire year. It is probable that when the male plant is introduced and pollination is effected, that the duration of the brilliant color will be limited by the production of fruit and seed."

NEW RACE OF CHRYSANTHEMUMS. — The Japanese gardeners seem to show greater skill in producing new races of old stand-by flowers than do the florists of the New World or of Europe. In the Chrysanthemum, especially, we find striking variations. Now we give an illustration from our excellent contemporary, the London *Gardeners' Chronicle*, of a novel type, of striking character. It was raised from seed sent from Japan to Mr. J. H. Witty, of Nunhead, England.

After describing one of no especial value for ornamental purposes, it says :—

"In the case of Golden Shower, the case may be different. Indeed, the Floral Committee of the Royal Horticultural Society have already bestowed an Award of Merit upon the variety, which will afford novel and attractive flowers for decorative effects. The thread-like florets are mostly golden-yellow, but some are red.

"In Golden Shower the long thread-like florets are really flattish ribbons (ligules), and the receptacle or dome-shaped cushion from which the florets spring is thickly covered with membranous pointed bracts—one to each floret."



GOLDEN SHOWER CHRYSANTHEMUM.

EUPHORBIA FULGENS FOR WINTER-FLOWERING.—It is pleasing to notice the interest some florists take in making popular comparatively unknown, desirable plants. One of these particularly impressed the writer on a recent delightful visit to the extensive greenhouses of Mr. Robert Craig, one of Philadelphia's most intelligent and progressive florists. This plant is by no means new, but it has had its wave of popularity years ago, and is not now generally grown. *Euphorbia Jacquinæflora* is the name by which it is generally known, though properly *E. fulgens*. Its flowers or bracts are small but numerous, of an orange-scarlet color, and are produced continuously throughout the winter. For winter flowering, it is scarcely excelled. It likes plenty of heat and little root-disturbance.

WEEPING AMERICAN CHERRY.—One of the most beautiful of weeping trees is the variety of *Prunus serotina*, *P. serotina pendula* of catalogues. It was found among some thousands of seedlings of the ordinary Wild Cherry in a nursery near Dresden, in Saxony, and introduced in 1886 by C. W. Mielzsch of that city. Unfortunately, the branches are very brittle, and nurserymen cannot handle it to satisfaction. By the time it is delivered to a customer, there is little remaining of the head but the stock on which it was grafted.

DEATH BY SUFFOCATION.—Trees, and, indeed, all terrestrial vegetation, will live for months in winter when their roots and stems are wholly under water,—but are killed in a few days if a sudden overflow keeps the roots under water in the growing season. The roots, needing air at that season, are suffocated. The practical cultivator, of an observant turn of mind, makes admirable use of this knowledge in many gardening operations. Plants desired in low situations, where they would not under usual conditions survive, should not be set deeply.

THE HARDY FLOWER GARDEN.

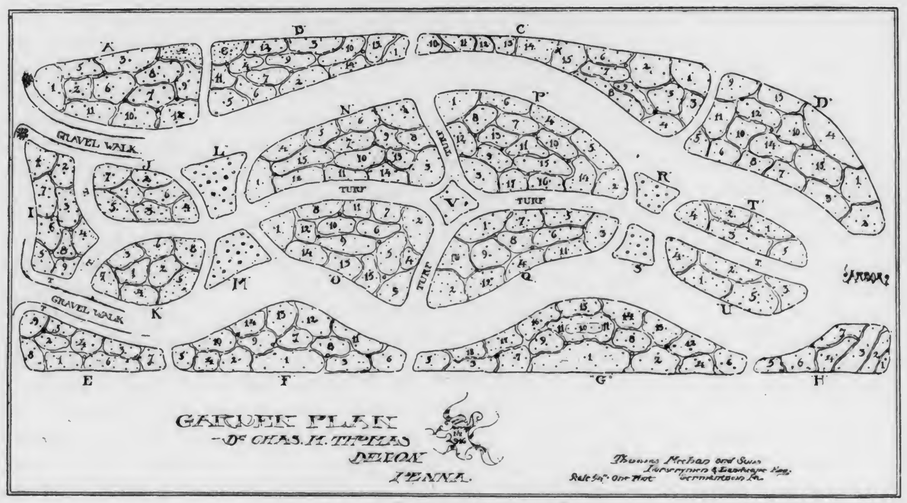
HERBACEOUS PLANT BORDERS.—It is probable that mass bedding, in which one or a few more kinds of plant are set for effect,—and mosaic culture, which means the planting to arrange in artistic work like carpets or other fancy work,—will never wholly depart from us. For grand effects in parks and large gardens, or even on small grounds in special cases, no system could well supply the place of this form of garden art. But it has ran to such an extreme that real lovers of flowers have become dissatisfied, and there is a general longing for a return to the "grandmother's gardens" of the olden time. These little "flower knots," with their neat borders of box or other edgings, were certainly attractive for what they contained, though termed stiff and unnatural by the cultivated, artistic eye.

There is, however, no reason why a collection of hardy herbaceous plants should not be so arranged as to have pretty, flowing lines to the ground they occupy. All that is required is for the landscape gardener to keep in mind that the flowers have to be examined closely, and that length, but not breadth, should prevail in the design.

With this is given the plan of one on the grounds of Dr. Chas. H. Thomas, of Devon, Penna. The main walks to the arbor are of gravel,—the narrower ones of neatly mown grass. The list of the kinds growing there are given with corresponding numbers.

The list may be suggestive in a general way, though of course the selections for each garden must vary with soil, character of the spot, and latitude.

GALTONIA (HYACINTHUS) CANDICANS.—As a hardy, summer-flowering bulb for introducing into beds of shrubbery or herbaceous borders, *Galtonia candicans* deserves to rank with lilies in utility, and, in some degree, in beauty. The sturdy stalk of flowers attains a height of from three to five feet, the white bell-shaped flowers hanging gracefully in character, not unlike the Yucca, though of course smaller. Like the flowers of most bulbs, they are very lasting, and make a continuous display for at least four weeks about mid-summer; and occasionally a second stalk will be thrown up succeeding the other. Frequently this bulb is called a hyacinth, though it is not in very general cultivation. It is a native of South Africa, and perfectly hardy in the United States. As the individual flowers are only an inch long, the display will be greater where several bulbs are planted within a foot of each other. Closer than that is unnecessary.



PLAN OF HARDY FLOWER GARDEN.

KEY TO PLANTING PLAN.

KEY NO.	NAME
	Bed A.
1	Hypericum Moserianum.
2	Delphinium hybridum.
3	Helenium autumnale.
4	Convallaria majalis.
5	Vernonia Arkansana.
6	Lysimachia clethroides.
7	Iris Germanica.
8	Phlox decussata.
9	Aneuone.
10	Coreopsis grandiflora
11	Lychnis flos cuculi semperflorens
12	Veronica Heudersoni.
0	Galtonia candicans.
x	Lilium speciosum.
	Bed B.
1	Gaillardia grandiflora.
2	Betonica rosea.
3	Helianthus multiflorus plenus.
4	Aster N. B Robt. Parker.
5	Anthemis tiuctoria.
6	Aquilegia Skinneri
7	Lychnis chalcedonica alba.
8	Convallaria majalis.
9	Digitalis purpurea.
10	Platycodon grandiflorum album.
11	Iris graminea.
12	Physostegia denticulata.
13	Dicentra spectabilis.
14	Œnothera riparia.
0	Galtonia candicans.
	Bed C.
1	Aster Novæ-Angliæ.
2	Helianthus Maximilliani.
3	Coreopsis grandiflora.
4	Aquilegia Skinneri.
5	Iris Germanica
6	Boltonia glastifolia.
7	Vernonia Baldwini.
8	Asclepias tuberosa
9	Phlox decussata
10	Gaillardia grandiflora.
11	Chrysanthemum, hardy.
12	Astilbe Japonica.
13	Funkia Jap. alba.
14	Calimeris incisa
15	Physostegia denticulata.
0	Lilium tigrinum splendens.
x	" auratum.
x	" speciosum.
	Bed D.
1	White Hollyhocks.
2	Vernonia Arkansana.
3	Monarda didyma.
4	Rudbeckia Golden Glow.
5	Pyrethrum roseum.
7	Aquilegia cærulea.
8	Anemone.
9	Aster Novæ-Angliæ.
10	Digitalis purpurea alba.
11	Coreopsis grandiflora.
12	Pyrethrum uliginosum.
13	Hibiscus white.
14	Vernonia Baldwini.
15	Delphinium Chinensis.
16	Hemerocallis fulva.
0	Galtonia candicans.
	Bed E.
1	Aster Tataricas.
2	Helianthus mollis.
3	Tritoma uvaria.
4	Platycodon grandiflorum album.
5	Aquilegia cærulea alba.
6	Lythrum Salicaria.
7	Silphium laciniatum.
8	Lysimachia vulgaris.
9	Achillea "Pearl."
0	Galtonia candicans
x	Lilium speciosum.
	Bed F.
1	Helianthus Maximilliani.
2	Physostegia denticulata.
3	Hibiscus militaris.
4	Digitalis purpurea.
5	Chrysanthemum, hardy.
6	Pæonies, dbl. red.
7	Delphinium.
8	Lythrum salicaria.
9	Hemerocallis Kwanso fl. pl.
10	Veronica Hendersoni.
11	Santolina incana.
12	Iris graminea.
13	Coreopsis grandiflora.
14	Funkia Jap. alba.
0	Lilium tigrinum splendens.
x	" candidum.
	Bed G.
1	Rudbeckia Golden Glow.
2	Boltonia glastifolia
3	Allegheny Hollyhocks.
4	Delphinium.
5	Iris Germanica.
6	" "
7	Phlox, white (tall) or "Henry Murgher."
8	Phlox, red
9	Monarda purpurea.
10	Belamcanda Chinensis
11	Iris florentina.
12	Pæonies, single, pink.
13	Veronica Teucrium
14	Hemerocallis graminea.
15	Gaillardia grandiflora.
16	Aquilegia chrysantha.
17	Anemone
18	Anthemis tinctoria.
0	Lilium tigrinum splendens.
x	" candidum.
	Bed H.
1	Arundo Donax.
2	" " variegata.
3	Eulalia Jap. gracillima.
4	Hollyhocks, Allegheny.
5	Pæonies, dbl. white.
6	Lysimachia verticillata.
7	Baptisia tinctoria.
	Bed I.
1	Hypericum Moserianum.
2	Aquilegia truncata.
3	Geranium sanguineum.
4	Anemone
5	Coreopsis grandiflora.
6	Heuchera sanguinea.
7	Lobelia syphillitica.
8	Pæonia tenuifolia fl. pl.
9	Dianthus barbatus.
10	Lilium candidum.
	Bed J.
1	Lychnis chalcedonica.
2	Spiræa Ulmaria fl. pl.
3	Plumbago Larpentæ.
4	Achillea tomentosa.
5	Œnothera macrocarpa.
6	Armeria maritima.
7	Achillea "The Pearl."
	Bed K.
1	Pentstemon Digitalis.
2	Tritoma uvaria.
3	Achillea millefolium rubrum.
4	Alyssum argeuteum.
5	Coreopsis rosea.
6	Iberis [ens
7	Lychnis Flos cuculi semperflor-
8	Hypericum calycinum.
	Bed L.
1	Iris lævigata.
x	Papaver orientale.
x	Lilium candidum.
	Bed M.
1	Iris lævigata
0	Papaver orientale.
x	Lilium speciosum.
	Bed N.
1	Aquilegia cærulea.
2	Veronica Hendersoni.
3	Physostegia denticulata.
4	Stokesia cyanea.
5	Spiræa Ulmaria fl. pl.
6	Anemone Jap white.
7	Lobelia cardinalis.
8	Achillea "The Pearl."
9	Dicentra spectabilis.
10	Digitalis purpurea alba.
11	Dianthus barbatus.
12	Hypericum patulum.
13	Pyrethrum roseum
14	Delphinium elatum.
15	Platycodon grandiflorum album.
0	Lilium auratum and speciosum.
	Bed O.
1	Platycodon Mariesii.
2	Eupatorium ageratoides.
3	Veronica villosa.
4	Tritoma uvaria.
5	Aquilegia cærulea.
6	Aster longifolius Lady Trevelyn.
7	Delphinium elatum.
8	Asclepias tuberosa.
9	Vernonia Baldwini.
10	Iris orientalis.
11	Chelone Lyoni.
12	Tradescantia Vir alba.
13	Coreopsis rosea.
14	Geranium sanguinea.
15	Gaillardia grandiflora.
0	Lilium auratum and speciosum.
	Bed P.
1	Anemone Jap.
2	Dictamnus Fraxinella.
3	Vernonia Baldwini.
4	Iberis.
5	Alyssum argenteum.
6	Plumbago.
7	Œnothera riparia.
8	Lobelia syphillitica
9	Monarda purpurea.
10	Tradescantia Virginica.
11	Tritoma uvaria.
12	Betonica officinale.
13	Valeriana dioica,
14	Psoralea sub-acaulis.
15	Aster oblongifolius
16	Aquilegia Canadensis
17	Baptisia australis.
0	Lilium speciosum and auratum.
	Bed Q.
1	Phlox decussata
2	Funkia Jap. alba.
3	Pæonia tenuifolia fl. pl.
4	Dianthus plumarius.
5	Anemone Jap. red.
6	Asclepias tuberosa.
7	Delphinium formosum.
8	Iris florentina.
9	Digitalis purpurea.
10	Aquilegia chrysantha.
11	Arabis albida.
12	Betonica rosea.
0	Lilium auratum and speciosum.
	Bed R.
1	Hemerocallis flava.
0	Gladiolus communis.
	Bed S.
1	Hemerocallis graminea.
0	Tulipa sylvestris.
	Bed T.
1	Coreopsis rosea.
2	Iberis.
3	Anemone Jap. rubra.
4	Betonica officinalis.
5	Platycodon Mariesii.
	Bed U.
1	Heuchera sanguinea.
2	Anemone Jap alba.
3	Gaillardia grandiflora.
4	Armeria maritima.
5	Dianthus barbatus.
	Bed V.
1	Gynerium argenteum

FRUITS AND VEGETABLES.

COLD-FRAMES AND HOT-BEDS.—The value of frames to a small garden is seldom estimated. Very few large gardens but contain them, yet in a way they are of more value where land for garden purposes is not plentiful. In the latter case the owner, who wants to fully supply his table with fresh things, tries to get all that he possibly can out of his limited space. By means of a moderate size hot-bed, lettuce, radishes and other quickly maturing plants may be raised for winter use. Other plants may be started in late winter, for transplanting to the open ground in spring, thus securing the earliest crops possible, and opening the way for a succession of crops to take the place of the early ones. Of course, this sounds more extensive than it really is, for all vegetables cannot be handled alike; but sufficient that it can be done to some extent by a careful and studious gardener.

Considerable judgment must be exercised to make thorough success,—for instance, the depth of the pit must be regulated to agree with the plants to be grown. As an example, lettuce,—especially that grown in early winter,—is liable to draw upward to the light, a very undesirable thing where good, solid heads are wanted. Therefore, the pit should be shallow to bring the plants fairly near the glass. This also applies to all seedlings intended for transplanting; they must not be drawn up, spindling and weak, but encouraged to grow solid and stocky. Even such slender things as peas could be started a trifle earlier by sowing the seed in pots plunged in the frame, and transplanted later. This would not pay on a large scale, but to obtain a few dishes for the table it would be desirable. Then care must be taken in the regulation of air and protection from frost, for, raised in this way, plants are delicate.

Cold-frames are chiefly of use as hot-bed feeders, or for giving plants a slight start in spring. They must be prepared in August ready for early fall sowing. The seedlings are hardened off and held until transplanted to hot-beds or to the open ground. Such nearly hardy plants as corn salad and lettuce may be raised in cold-frames in the fall and early winter by protecting them slightly on frosty nights.

Frames designed for vegetables may be brought into further utility, where the owner is so inclined, by putting in a few easily-forced flowers, such as violets, pansies, bulbs, etc.

As to the making of the frames, it is an easy matter. The chief requirements are shelter, drainage, light and proper ventilation, and, in hot-beds, regulated temperature. A spot sheltered on the north and west, free to the sun, is considered ideal. If there is danger of rains washing in, the bed level must be raised, and earth and coarse litter banked around it. The back, which will be towards the northwest, should be higher than the front, the slope permitting the water to shed from the glass. The top is of glass, fit in sash about four feet wide by six long, made to slide back or raise, by which means the beds are ventilated.

The bed for a cold-frame should be finely pulverized loam, obtained from the surface of some land that has been standing at least two or three years; or any good, light soil with which may be well mixed some well-rotted horse manure,—a desirable addition in either case. The bed should be from 18 inches to 2 feet in depth, and be closely placed in the frame.

A hot-bed is something similar, excepting that the "hot" must be furnished. The heat is derived from fermenting horse manure, which is placed in a bed to the depth of a foot or two. This manure should not be strictly fresh, but first heaped up and forked over several times before it has chance to burn, which can also be prevented by watering. The manure finally placed, its temperature must be kept until it is reduced to about 75° Fahr. In the meantime, about six inches of fine loam is spread on the bed. A thermometer should always be kept handy, and the tests made by plunging it in the bed.

When in use, a mat of some kind must be placed over the closed sash late in the afternoon, and removed when the sun is well up in the following morning.

Sash are not profitably made at home, but can be procured from any horticultural builder or wood-working mill. Suitable mats are also bought ready-made, though excellent ones can be made of straw, and light ones, easily dried, are preferable.

BIOGRAPHY AND LITERATURE.

AN AUTUMN WALK.

'Twas on a mild autumnal day,
We slowly wandered, arm in arm,
Through fields and woodland, far away,
Lured by the season's subtle charm.

We heard the air of autumn mourn
Among the rustling ruches sere,
And reached at last the churchyard-bourne,
Whose oaks were fading with the year.

—HOWARD WORCESTER GILBERT.

THE NATIONAL FLOWER.—In regard to the national flower, I would say I think it should be *Aquilegia Canadensis* (Columbine), for the reason that on the ends of the flowers that long projection turns over like the liberty cap; and then, too, it is found throughout the United States. I have seen it growing in Connecticut and California. It is called the "wild Columbine of the United States." It is one of the national colors, red, and very pretty. C. A. PITKIN, JR.

Willow Glen, Santa Clara Co., California.

When, some years ago, MEEHANS' MONTHLY suggested that some association with human events was necessary to make a flower essential to human veneration, it referred to the Columbine as being eligible. Columbo—the root of the name Columbus—signifying dove,—and the story of the Columbo being sent out of the ark to find land, being analogous to the modern Columbo starting from Spain and discovering the New World. It seemed to MEEHANS' MONTHLY to be one of the few flowers that could be brought into any association with American history.

But MEEHANS' MONTHLY and our correspondent have been over-reached by the Legislature of the Centennial State by a special act declaring the Columbine the State flower of Colorado.

WILLIAM MCMILLAN.—Public gardening has lost an able representative in the death of Mr. William McMillan, for many years the leading spirit in the development of the beautiful public parks of Buffalo. Through some difference of opinion with the authorities, he was induced to leave this honorable position a few years ago, and accept a similar responsibility in the Essex County Park, at Essex, New Jersey. He was born in Scotland, and died at Newark, N. J., on the 1st of August, in his 68th year.

GERMAN GARDEN MANUALS. At the small price of 1.20 marks each, Karl Siegismund, bookseller, Berlin, Germany, is issuing small, prettily-illustrated volumes, forming a complete series of garden manuals, each volume by well-known and eminent authors. Though founded on the practice in German gardens, that practice is so generally intelligent that any one in America interested in gardening, who can read German, will find them instructive and of importance in a library collection. Of those before us the titles are as follows: Vol. 5, Zimmerblütenpflanzen; 7, Der Gartenrosen; 8, Die Farnpflanzen; 9, Der Zwergobstbau; 10, Die Standengewächse; 12, Pfirsiche und Aprikosen.

THE RHODODENDRON.—FREEZING OF SAP IN WINTER.—Rhododendron leaves, as is well known, curl and droop in severe weather, just as they do in summer under a drouth. The subject is investigated by Dr. J. H. Harshberger in a recent issue of the Proceedings of the Academy of Natural Sciences of Philadelphia. He finds the object to be to check transpiration, which is as severe a strain on vegetation as drouth in summer would be. His observations on the process are very interesting. The leaves on a frozen plant brought into a temperature of 75° to 80° commenced to move in one hour and a half; and the curled leaf commenced to unroll in two hours. The leaves on the main leader responded more promptly than those on the laterals, vital energy being greater there. Taken again to the cold, shrinking commenced in three minutes, and in ten had reached the ultimate close coil. Under the microscope he finds the inter-

cellular spaces of importance in the movement. The sap leaves the cells for the intercellular spaces, and contraction follows the movements.

Dr. Harshberger's valuable experiments are all in line with the observations of modern gardening. It has long been obvious to intelligent observers that, under known physical laws, the juices in the cells of plants could not freeze without rupturing them,—and it also has long been known that nearly all plants shrink instead of expand, as cold weather progresses. Healthy growing trees have a less girth in winter than in summer, and the hardy cactuses, that one might think surcharged with moisture, as a bladder is with air, shrink one-half in volume, without losing weight in the winter season. With Dr. Harshberger's explanation, that the water passes from the cells to the air spaces, when necessary to avoid rupture, the former problem is rendered very clear.

HISTORY OF THE VIOLET.—A South Carolina correspondent says:—

"It is long past the season in this hot climate for violets to flower, but I wish you could see my violet plants—"Russian" variety. Their foliage is superb—at least, in my eyes. The dark, rich, green leaves on petioles 14 to 16 inches long, measure from 5 to 6 inches long and proportionately broad. But the plants in season never yielded many flowers. Why did they simply run to herbage? Apropos of the subject, I am deeply interested in its history, and will take it as a very great favor if you will help me to a knowledge of it. Has there ever been written a monograph on the violet? I remember once to have read of ancient Athens as "Violet crowned." Was it the chosen floral emblem of the classic city? Can you tell me anything of its ancient associations, history or tradition—or suggest to me what to read on the topic? I will thank you sincerely."

The Russian Sweet Violet is regarded as a distinct species from the ordinary sweet violet of England and the Continent. This is *Viola odorata*, while the Russian is *Viola taurica*. The large, luxuriant foliage referred to by our correspondent is one of the distinguishing characters. The history of the violet goes far back into antiquity. We should have to go into the stories of the gods and goddesses of Olympus, and tell how Ianthe was beloved by Phoebus, much to the horror of Diana, in whose train she served. She was turned into a violet so as to be hidden from Phoebus' warm attractions, and where she could modestly bloom in March without the sun-god knowing anything about her. And we should have to go over the charms of Cytheræa, and her famous sweetness of breath among the sum of these charms, and all obtained by feeding on violets! And then we might speculate on the Norsemen's annual feast of violets,—on that March Tuesday, that possibly gave the name "March Violet" to the plant;—and those fond of showing chronological imperfections, and with a love for picking old stories to pieces by the sharp weapon of logic, might argue that it was the Russian Violet, after all, that should claim the credit of the Norsemen's veneration, and that the modern reference of the March Violet, to the violet of English literature, is all apochryphal.

Yes! there is much that might be popularly said in a work on the violet,—but we do not know that it has ever been attempted.

As to a botanical monograph,—when it is understood that there are over five hundred recognized species, besides any number of synonyms, such a task would not be very inviting to a busy person.

NEW NORTH AMERICAN PLANTS.—Collecting botanists in our country need not fear their chances of finding new species fading. Mr. T. S. Brandegee describes, in the June issue of the *Botanical Gazette*, twenty-nine new ones found in California. One of these forms a new genus, named in honor of Dr. Perpus, *Perpusia*. It is related to *Potentilla*. Four new Pentstemons are included in the list, and several others will doubtless ornament our gardens in time.

FLOWER FESTIVALS OF JAPAN.—The flower festival, or rather holiday season, of Japan begins with the first spring blossoms. In early March, the local papers note the swelling buds on the naked gray branches of the plum trees, that foretell the dainty blooms that are soon to enshroud them. All Japan rejoices when the buds cast off the last winter wrap and scent the air with spicy odors.

In early April when the cherry trees are glorified, Japan has another holiday, when all, from the Mikado to the meanest beggar, need go and visit the gardens of this queen of spring.

The wistaria comes next on this floral holiday calendar, and when the papers announce at last that her lustrous robes have purpled and the tender green is showing on the branch, she receives in her gardens the homage of a grateful, happy people. The hill-sides blazoned with scarlet azaleas, the lily, iris, peony, lordly lotus, reddening maple, chrysanthemum and camellia form a stately procession, each receiving devotion and eulogy in turn.

First in the heart of every traveler who has been so fortunate as to visit these simple floral fêtes are the cherry blossom and wistaria gardens. The Japanese love nature, not as a matter of dollars and cents, but because they have found reposeful happiness in the devotion. Their taste is correct and refined; it is not the rare, gaudy exotic that is most highly prized, but the common flowers of their country which are taken in natural sequence and by study and culture made the source of healthful national enjoyment. These flower fêtes are a sort of bank holiday, business being generally suspended and the people given over to merry-making. Nothing surprises the intelligent traveler more than the simplicity and poetic refinement of these popular pleasures of the Japanese.

Many of the most famous gardens of Japan surround the temples. This is true in Kioto, the City of Flowers, where the great red, carved gateway of the ancient temple of Chionin gives entrance as well to the cherry-blossom garden. The blossoms last in perfection for about a week, and from early dawn to the midnight hour the throngs are passing to and fro. Staid merchants, with their families, Government officials, girls and children arrayed in their brightest kimonos and obies, flower-crowned geishas or dancing girls, all with careless happiness and gayety depicted upon their faces. There are hundreds of cherry trees, some of them great in size and gnarled with age, their bare, gray branches covered with myriads of snowy blossoms. An aged tree, the size of a large oak, is enthroned upon a circular mound. The people crowd the surrounding circle of seats, and they look at this tree's wondrous beauty, outlined against the soft, blue sky, enjoying every minute of their holiday. The shimmer of the blossom-crowned trees, the changing shadows, the bright costumes, the life and movement of the happy-hearted people, it is a dream of delight. At night many hundreds of varicolored lanterns swing with the breeze, showers of rosy-white petals sift through the semi-darkness. Hidden electric lights play upon the largest trees, bringing out the pearly, scintillating beauty. Mats or low platforms are arranged beneath the branches, and picnic feasts are enjoyed to the fill. It is true that there is an occasional drunken or "sake man" to be seen making grotesque efforts to amuse, but he is not so soddon or incapable as the drunken American, on such occasions.

At Uyeno Park, Tokio, the festive spectacle is re-enacted, if possible, more beautiful, more charming. Under the thick floral canopy whole families wander hand in hand, happy and free from care. Out on the banks of the broad river the people also congregate beneath the ancient cherry trees, whose gnarled branches are gray with age but powdered with the blossoms of recurring youth.

There are gardens and walks and drives throughout Japan too numerous to mention, which, at this season, are famous for their beauty. Every Japanese home, as well, has its lesser shrine of blooming tree or flowering branch.

The wistaria gardens are in May no less interesting. One of the most celebrated is at Kameido, in Tokio, located on the confines of the temple grounds. There you will see the same light-hearted, happy people; but the coloring of the myriad drooping clusters is lilac and purple, instead of white and pink. The picnic parties sit in the flickering shadows of the blooms; two and three feet deep of suspended lilac drapery, relieved by the twisted trunks and branches of these ancient vine-trees. The children sit on their heels, munching sweetmeats from little lacquer boxes; or lean over the railing and clap their hands, the signal for huge, lazy golden carp to rise to the surface to be fed with some tidbits. There is a soft, radiant beauty, a brilliance and gayety about the scene that are luxuriant and restful. There is a bridge in view which affords much amusement. It describes a little more than a semi-circle and it is a bit of a joke to successfully traverse it without mild accident.

EMORY E. SMITH.

GENERAL NOTES.

POISONOUS PLANTS.—One of the misfortunes of our time is that there is no attempt made to collate the large amount of facts spread over the literary world in the various publications issued everywhere. The United States Government, State establishments, and wealthy societies might well undertake tasks of this kind, but instead, they spend time in experimenting, suggesting and noting about matters that have been abundantly testified to generations ago.

Just now before us an official document notes the bare possibility that precocious ripening in the peach may indicate the beginning of the disease known as the yellows,—and another, giving a list of the poisonous roots of plants growing in the State, without the slightest reference to the roots of the common elder, and expressing doubt about the noxious character of the edible parsnip in its wild state.

When Mr. Hovey, the President of the Massachusetts Horticultural Society, died, resolutions for the perpetuation of his memory covered many suggestions. The writer of this paragraph suggested that that Society could do no better honor to his memory than to make an index of his valuable magazine; that facts recorded through this great work would be invaluable to the cause of horticulture. Even at this late day, the writer feels the immense importance of such a task, and is making a subject index of "Hovey's Magazine" at his own expense.

MEEHANS' MONTHLY FOR REFERENCE LIBRARIES.—When founding MEEHANS' MONTHLY, the proprietors had to meet the difficulty of not being in the publishing business. They had not the organized machinery to make it at once generally known through the book-selling trade. All they could do was to let the merits of the work be its chief advertising agency. The fact that it was continuing in exactly the same form as the work of the popular "Flowers and Ferns of the United States," was a sufficient foundation for the belief that it must eventually become a necessary work of reference for every library that would be abreast of the times, and that the back numbers would be in demand when the existence of the work became known. A fair stock was held to cover this contingency. The past year has made heavy drafts on this surplus. As a large number of the new subscribers make the inquiry as to whether the back volumes may be obtained, it has been thought well to make this announcement, that they can still be furnished.

WINTER COURSES DISCONTINUED.—On account of insufficient appropriations by the Legislature, the Trustees of The Pennsylvania State College have been compelled, along with other measures of retrenchment, to discontinue for the present the twelve-weeks Winter Lecture Course in Agriculture and the Cheese-making Course. The Creamery Course will be given as heretofore, beginning January 3d, and the work of the regular four-years' course and of the special, one-year course, will go on as usual. Special efforts will also be made to increase the efficiency of the Correspondence Courses in Agriculture.

CHANGING THE NAMES OF PLANTS.—A botanical journal explains that the name of one of our California spruces must be changed, because it has just been discovered that "in an obscure circular, in 1852," some other name was proposed. If one, who believes he has a new plant to describe, must wait, "under the laws of priority," to be sure that he has at command even "obscure circulars" before he dares do anything with it, the sooner some other law takes it place, the better for the advancement of botanical knowledge. As General Grant once said, the best way to break up a bad law is to enforce it.

ASCLEPIAS TUBEROSA

ASCLEPIAS TUBEROSA.

ORANGE SWALLOW-WORT.

NATURAL ORDER, ASCLEPIADACEÆ

ASCLEPIAS TUBEROSA, Linnæus.—Hirsute or roughish pubescent, a foot or two high, very leafy to the top; leaves from lanceolate-oblong to linear-lanceolate, sessile or slightly petioled; umbels several and mostly cymose at the summit of the stem, short-peduncled; column short; hoods narrowly oblong, erect (two or three lines long), deep bright orange, much surpassing the anthers, almost as long as the purplish- or slightly greenish-orange oblong corolla-lobes, nearly equalled by the filiform-subulate horn; follicles cinereous pubescent. Gray's *Synoptical Flora of North America*. See also Gray's *Manual of the Botany of the Northern United States*, Chapman's *Flora of the Southern United States*, Wood's *Class Book of Botany*, and Britton and Brown's *Illustrated Flora of the Northern United States, Canada and the British Possessions*.

In the Orange Swallow-wort we have one of the most showy of our native flowers. We could scarcely say one of the most beautiful, for it is wanting in all the elements that go to make up the science of beauty except the minor element of color. The foliage is rough, and the habit of growth stiff; while the irregularity of the leaves on the branches, and of the branching itself, continually impresses the beholder that he is looking at something that ought not to be. In combination with other kinds of flowers, however, it adds largely to the beauty of our wild flower scenery. Travellers in the more uncultivated portions of our eastern territory always speak of it with admiration. As they look back on the pleasures of the past vigorous enjoyment of field and forest, our showy plant acts as a memorizer. When Oliver Wendel Holmes exclaimed -

> "O where, O where, are life's lilies and roses
> Nursed in the golden dawn's smile?
> Dead as the bulrushes 'round little Moses,
> On the old banks of the Nile,"

he would probably have missed our Swallow-wort, if he had sung of some American picture, instead of the visions the classical training "in his golden dawn" impressed on his imaginative mind. It is to be regretted that so few of our native flowers have had a seat by the poet's fire,—and that we have to look to the genii of the Old World for much of the floral sentiment that holds so high a place in the human mind.

A figure occurs in Edwards' "Botanical Magazine" for 1815, wherein is said it is "a plant generally native in most of the States of America, where it goes by several denominations—such as 'Butterfly-weed,' from being a favorite resort of the insects of that tribe; 'Pleurisy' or 'Ache-in-the-side plant,' from its medicinal virtues, said to be of considerable activity; besides some others."

The name of Swallow-wort comes down to us from the old herbalists. Plants were classified according to external resemblances. A number with curious seed-vessels, supposed to resemble swallows, formed the tribe *Hirundinaria*, from the Latin word *Hirundo*, the swallow. The *Asclepias*, especially, had pods of this character, and the common name followed this plant, when more natural arrangements of plants were made.

A narrow-leaved form occurs in the Southern States, which Mr. Pursh thought worth a varietal name as *decumbens*. Of this, the "Botanical Register" above cited remarks: "Mr. Pursh mentioned to us that he had found it growing on mounds of sand which had gradually accumulated by the wind to a considerable height, having a root which descended to near two fathoms in depth; that in such situations the stem was decumbent; in sheltered, fertile ones generally upright."

According to Pursh, the common name of "Butterfly-weed" is derived from the flowers being a favorite resort with insects of that tribe,—but it does not appear to be any more of a favorite than many other flowers. The nectaries—the upper portion of the flower (Fig. 3)—is filled with nectar at certain times, and is so readily accessible that insects have little difficulty in appropriating it.

COLOR PLATE

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COLOR PLATE
INTENTIONAL SECOND EXPOSURE

The structure of the flowers is an extremely interesting subject with the student in botany. It is much more simple than might be inferred from some attempts that have been made to explain it. There is no special plan, but a modification of the general plan on which all flowers are formed. Flowers are usually constructed on a uniform plan under a given numeral. If, for instance, on a plan of three, we should expect to find three sepals, three petals, three stamens, and three styles. If there were more, they would be in sets of six or nine. When the numbers were intermediate, we should look for abortion, or consolidation of parts.

This is the condition of things in *Asclepias*. Both abortion of some parts, and a consolidation of others, prevail. Nature starts on a plan of five. The five small, green sepals are shown in Fig. 5. Fig. 4 represents the five petals. Fig. 3 is five stamens; but the anthers have not been normally developed, and appear as nectaries,—the nectariferous organs comprise a series of five petaliferous stamens. Next we have five more perfect, pollen-bearing stamens,—and, finally, two styles. We expect the series of organs, as detailed, to alternate with each other. That these do so alternate, is additional proof of the correctness of the diagnosis. We may say that the flower of an *Asclepias* consists of five sepals, five petals, ten stamens, and two styles,—and the reason why there are not five styles, is because three have disappeared by abortion. It would be legitimate to look for five carpels in some closely-related natural order. It is usual to describe *Asclepias* as having a five-lobed stigma. This is morphologically impossible. There may be a five-lobed stigma from a single style when that style is formed from five consolidated carpels, but not from two. The supposed umbonate stigma is composed of the five incurved points of the stamens, which have become consolidated and succulent. This cap completely covers the two stigmas. It effectually prevents pollenization by insect agency. The anther-cells are in close relation to the imbedded stigmas, and there is no difficulty in tubes from the pollen mass reaching them.

Aside from the knowledge gained by a dissection of the flower, the abundance of seed vessels produced by most species of *Asclepias* point to self-fertilization. The production of seed vessels seems wholly a question of nutrition. The flowers that fail to produce seed, fail simply from the exhaustion of the nutritive powers of the plant.

In the motions of plants, much pleasure may be taken. *Asclepias tuberosa* has some that are peculiar. The flower buds open their petals rapidly, and, in a few minutes, take the drooping but incurved character represented in Fig. 2. When about to fade, they assume an erect position, especially after the flower has been fertilized. When the ovary develops, it is erect; but soon afterwards the pedicel of the fertilized flower curves downwards. The ovary, however, turns upwards. At maturity, the seed vessel is perfectly erect, the pedicel remaining curved, the whole representing the curved bracket of a chandelier. In some cases the pedicel has a somewhat tortuous character, as if it were in the initial stage of some twining plant.

Asclepias tuberosa was one of the earliest of our native flowers to invite culture in English gardens. Two or three hundred years ago, the Royal Gardens at Hampton Court, in England, were, what Kew later became, the great centre for novelties. It is on record that our plant was in the collection, there, in 1690. The plants for this collection came largely by way of Holland. It was described by Paul Hermann, about this time, as an *Apocynum* from New England, hairy, tuberous-rooted, and with orange flowers. When later it came to be known as *Asclepias tuberosa*, the origin of the name may be traced to this description by Hermann.

In connection with geographical botany, the curious fact has been demonstrated, that in many instances, where there are a number of species to a genus in Eastern North America, one or more of the species may be found also in Japan. The whole territory west of the Rocky Mountains may have different species of the same genus; but the identical Eastern species appears in Japan. In the case of *Asclepias*, not only is there no Eastern American species in Japan, but no *Asclepias* of any kind,—though the genus *Vincetoxicum*, from which *Asclepias* has been divided, is abundantly represented there.

EXPLANATION OF THE PLATE.—1. Upper portion of a specimen from Pennsylvania. 2. A flower with its slender pedicel,—and (3) the erect nectaries, with (4) the reflexed petals. 5. The small five-parted calyx.

WILD FLOWERS AND NATURE.

AN AUTUMN WOOD.

"The leaves fell brown and dead upon the streams
And in the many winding woodland-ways.
And the blue haze again upon the hills
And o'er the sleeping waters spread its veil
All faint and dim, and from the misty deep
Of the great stream was heard the lonely cry
Of the solitary loon that lingered still upon its bosom."

—HOWARD WORCESTER GILBERT.

CYPRIPEDIUM ACAULE.—Your correspondent, on page 117, August number, expresses surprise that *Cypripedium acaule* should be found growing in dry oakwoods. I found them in mixed oak, chestnut and laurel woods, mostly under chestnut sprouts near laurel.

Lancaster, Pa. A. F. E.

It is much to be regretted that the many valuable facts recorded by observers in regard to the habits of plants, published from time to time in magazines like MEEHANS' MONTHLY, are not scheduled by the leaders in science who draw generalizations as regards the laws of nature. When writing of the unchanged cranberry under different "environments," lately, so much more might be said of other plants. The writer has seen, in the West, as our correspondent noted, *Cypripedium acaule* in swampy places,—in fact, often in bogs,—while it is well known, as the paragraph from Lancaster County notes, that its favorite home is in shady woods. In the writer's experience, it has been seen abundantly in Hemlock forests, where little other vegetation could live at all; yet, under these very different conditions of "environment," for so many ages, no change of characters can be seen. The Bearberry, *Arctostaphylos Uva-ursi*, clothing the heights of Pike's Peak, and the *Leiophyllum buxifolium*, in North Carolina, evidently existing on the spot when these great mountains were raised, are precisely the same yet as the plants we admire so much in the pine barrens of New Jersey. "Change by environment" must have some support, or a "School of Ecology" would not be founded thereon,—but the opposing facts are no less curious.

THE MAPLE TREE A NATURAL BAROMETER.—For nearly twenty years I have experimented with the maple and its sap during spring flow, and for three seasons last past I have continued the experiments through the summer with some variation. Probably I have made nearly or quite one hundred experiments during this time. For some years past I have noticed analagous conditions existing between maple trees and the barometer, both in winter and in summer, while the tree is at rest and also when in active growth.

A gauge attached to a maple in the time of sap-flow measures the amount (in pounds) of pressure upon a square inch, and a mercurial gauge will measure also the number of pounds suction. These conditions of the tree do not exist in the summer, so a gauge would be of no use at this season. In good sap weather the tree is in pressure during the day and it is in suction through the night. I reason that pressure and suction are equal, though I do not know it. A low barometer indicates zero in the maple. A rising barometer indicates pressure or sap-flow. The faster sap runs the higher the mercury rises in the barometer.

By watching these conditions of the maple in connection with the barometer, the one can be told from the other. A glass tube, two feet in length, attached to a tree and filled with water in summer, or while the tree is active, will indicate the relation existing between the tree and the atmosphere as relates to evaporation and absorption. This is done by watching the movement or non-movement of the water. When the water is descending in the tube rapidly (as, for instance, twenty-four inches in twelve hours), the tree is rapidly evaporating, and, also, it is as rapidly absorbing water from the soil and air. At such a time the mercury will stand high in the barom-

eter. When the water in the tube does not settle, then the moisture in the tree and atmosphere are in equilibrium. The tree and atmosphere are equally saturated and the mercury in the barometer is low. By looking at the tube I can tell when the tree is evaporating and absorbing; these processes go on together. When a tree does not evaporate it will not absorb.

In conducting these experiments in winter and summer five instruments are necessary—a gauge, glass tube, thermometer, barometer and hygrometer. I have all but the latter. I theorize that the tube and the hygrometer will agree. These two instruments will indicate the condition of the tree and the atmosphere as to saturation. TIMOTHY WHEELER.

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Besides the two North American species, there is another, *Downingia pusilla*, found in Chili.

PERFORATED BEECH LEAVES.—Mr. W. C. Egan, Highland Park, Illinois, sends samples of English Beech leaves, that have taken notion to have the upper half perforated—if a longitudinal space may be termed a perforation. They resemble combs, only with a bordering at the margin, as if to preserve the comb-teeth from breaking. In some cases, the leaf-blade seems so much eaten away, that little but the veins are left.

Even this phenomenon may have a bearing on the problems of plant-life. The popular impression would be that the veins of the leaves would first be constructed and then the cellular mass be drawn over it. First the skeleton, then the flesh. But phytologists insist on the reverse. Their view is that the ribs and veins of leaves are the result of a necessity for strengthening the expansion. The cellular tissue then changes its form to provide for this,—and the forms of leaves result from the degrees of energy expended in the task. Now, in the beech-leaf case, there seems to be veins formed with no tissue to support, and it would seem to contradict the general principle as to the origin of leaf-ribs.

But here we have to remember another principle of plant-life, that is being laid bare to us in recent times, namely, that nothing in nature is governed by a single law, but depends on the operation of laws acting in concert, and sometimes one will become abnormally active, leading the observer to a seeming contradiction in results.

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INJURIOUS FUNGUSES.—Of the many advances that have been made in garden art during the past half of the century, few compare in practical value with the knowledge of the relation which the fungus tribe holds to health and disease in plants. There are species that are indispensable to health, while others are the enemies of plant-life,—many, indeed, absolutely causing disease. Some of these are more vicious than others; while some will attack the healthiest vegetation. Just as the mistletoe will fasten itself to the most vigorous tree, there are others that commence life by fastening themselves on weak or dead portions,—but, when once started, make sad work on parts of the structure that are sound in every respect. Of this latter class is the one illustrated.

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The only remedy in this case is to cut out all the decayed portion to where the living wood and bark is found, and coat the exposed portion with something that will keep out air and water, arresting decay until the sound bark and wood has had time to grow over.

The experienced gardener does not wait for the appearance of the fungus to warn him of danger. If the trunk does not seem to increase in girth equally all round, he suspects something wrong, and a tap with a knife handle tells him by the sound that he is right.

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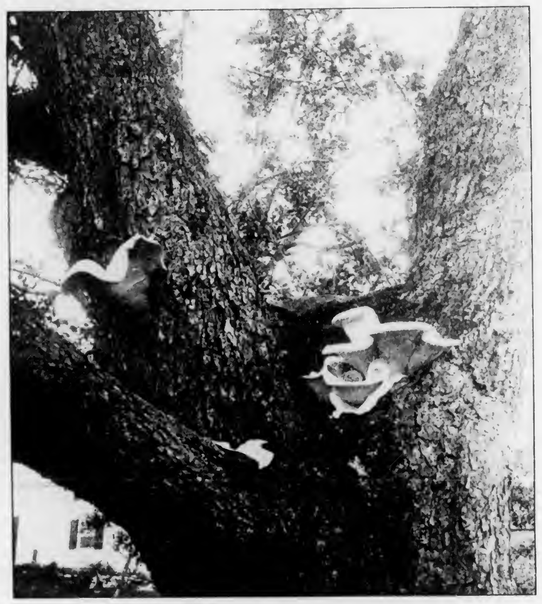

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INTENTIONAL SECOND EXPOSURE

GENERAL GARDENING.

AN AUTUMN DIRGE.

A spirit haunts the year's last hours,
Dwelling amid these yellowing bowers:
To himself he talks.
For at eventide, listening earnestly,
At his work you may hear him sob and sigh,
In the walks.

Earthward he boweth the heavy stalks
Of the mouldering flowers;
Heavily hangs the broad sun-flower;
Over its grave in the earth so chilly;
Heavily hangs the hollyhock,
Heavily hangs the tiger lily.

—TENNYSON.

PERMANENT TREE LABELS.—Mr. Chas. L. Druery, Acton, near London, England, sends specimens of tree labels made of cast iron with raised enamelled lettering. Others are black lettered on a white ground. Those who have collections of trees, shrubs or flowers that it is desirable to have permanently named, need only send on the lists desired, and the labels with the names are prepared for them.

A LONG-KEEPING CHRYSANTHEMUM. — A good yellow chrysanthemum, Major Bonnaffon, is recommended by Mr. Robert Craig, an authority, as one of the best for lasting after being cut. It is one of the Japanese incurved type.

WINTER-FLOWERING OF HARDY PLANTS,—ASPHODELINE LUTEA.—There are many hardy plants that are superior for winter-flowering, and were more attention paid to introducing such to greenhouse culture, the assortment of available stock would be materially improved. A hardy herbaceous plant was favorably brought to the writer's notice recently, viz:—*Asphodeline lutea*. It has a bright, conspicuous flower, that can be brought in by Christmas.

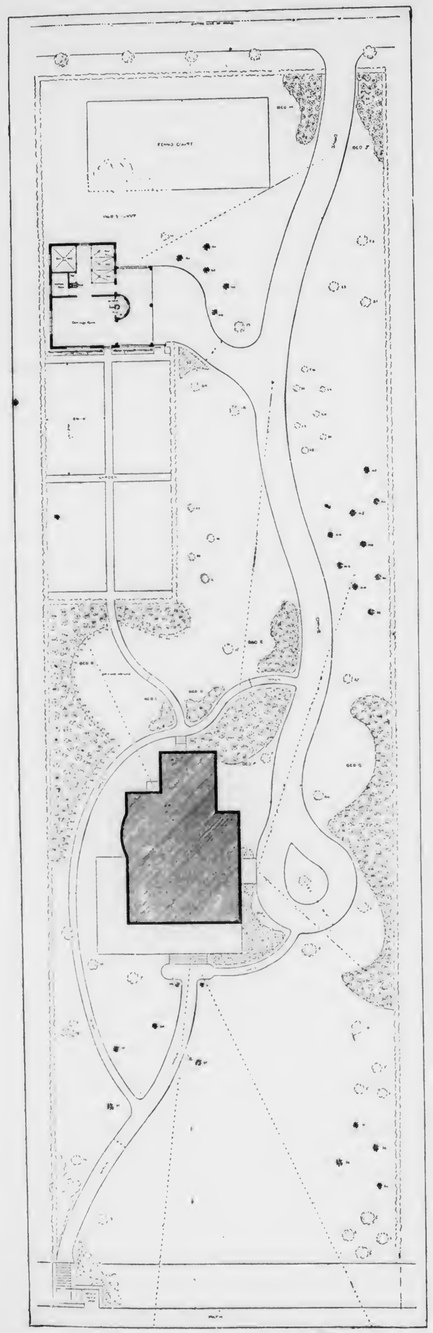
AMERICAN FORESTRY. — A correspondent some months since inquired where he could get a work that would teach him the art of American Forestry, so that he could derive profits from his labors with as much certainty as could be expected from other agricultural investment. It could only be answered that American Forestry had not reached that stage. A correspondent of *American Gardening* believes this reply will do more harm than good, and refers to the successful forestry of Holland. Unfortunately for us, in the Old World, Forestry, in the real sense of the word, is mostly the concern of the State; but here we have to do with individual initiative. To our mind, the art in America must have a different basis to the art in the countries referred to.

THE PESTS OF THE GARDENER.—The conductors receive continually some fungus, insect, or weed, that has startled cultivators in some district. The senders want to know its name, its history, and what is to be done about it. As a matter of botanical or entomological interest, it is profitable to know the name or history,—but as to what is to be done about it? the answer is very simple, and can be told without any of the more strictly scientific matters being called in.

As for the weed, no plant can live if not allowed to mature its early spring leaves. The garden-hoe or field-cultivator started early is a sure remedy against even the most pestiferous. In the case of insects, all that chew can be killed by a careful use of Paris Green; and all that suck, by having their breathing pores clogged by kerosene emulsion. As for parasitic fungi, which includes mildews, molds, rusts, and similar minute organisms, solutions of copper are effective against any or all.

Watchfulness to note the first appearance of trouble is an essential ingredient in these recipes. They are of little service after the damage has been done.

SUBURBAN HOME GROUNDS.—Questions in regard to laying out deep and narrow lots in the suburban sections of large towns frequently come to the conductors' table. It is not easy



PLAN OF A LONG, NARROW PLOT.

to answer them, as local conditions require peculiar adaptations. Still one may learn a good deal from what another does. Annexed is a plan with description of the house and grounds of L. F. Loree, Esq., of Pittsburg, Pa.

The design herewith presented shows an arrangement for a long, narrow piece of ground. The house is set about 65 feet from the front building line, and is surrounded by a "California" or Japanese Privet hedge which forms a pleasing division between the adjoining properties and roadway. The front approach is from the railroad station and is 5 feet wide to the porch, the rear walk being reduced to 3 feet. Stone steps are provided at the terrace, the lawn being about 12 feet above the grade. The approach from the rear is by the carriage drive, which is so located to give room for planting on either side; the planting arrangement being open and principally of specimen plants. To the left, the stable and small vegetable garden are located; the latter is screened from view by a privet hedge. The centre walk through the garden leads direct to the stable, where an entrance is provided to the carriage room. The mass planting in the vicinity of the house is made up of *Spiræa*, *Viburnum*, Cornels, Pyruses, Weigelas, etc., with a goodly proportion of hardy perennials, to give an abundance of bloom when the shrubs are out of flower during the summer months. The shade trees are so placed to partially shade the living apartments of the house and at the same time to give ample room for sunlight at certain hours of the day. At the rear, the tennis court is provided, shaded by an old walnut tree which shows very indistinctly in the sketch.

DORMANT VEGETATION.—Mr. J. H. Fisher, Ruxton, Md., makes the following interesting observation:

Early last spring I planted an *Agapanthus umbellatus*. I planted it in a good sized pot and placed on the grass plot in a half shady position, in May, last year. I watched it, but no growth appeared, and when moving to the city, November 1st, emptied out of the pot, supposing it to be dead, and was surprised to find it in just the condition in which it reached me, alive but having made no growth. I showed to Wm. Frazier, florist, who was unable to advance a clear reason. He took it

over to his greenhouse, potted in fresh soil, and has had all winter in the moist atmosphere. I went for it this morning, expecting to see fresh, green growth, but was surprised to find it in the same condition as when received, and when delivered to him—live roots, but having made *no growth*. Is not this a strange case, and how to be explained? Had it been in my hands only, I would have been willing to attribute to my own ignorance.

May 6th, 1899.

There seems to have been no record of such behavior in the Blue African Lily, as the *Agapanthus umbellatus* is popularly termed; but a similar dormancy has been noted in other plants,—especially in some of the fleshy-rooted species of British orchids, which have been known to remain in the earth several seasons without sprouting. This reason has been given for the great abundance of some species at times, with their comparative scarcity in other seasons.

This irregularity has been noted in trees and seeds,—in seeds especially. Some will not sprout when the temperature is either above or below a certain point. If from not having absorbed enough moisture, or from other considerations not well understood, as seed sown in spring passes its own special temperature, it will not germinate under a higher one, but remains dormant until it has a chance the next season.

We may carry this along as a probable reason for the behavior of the lily. It was not quite ready to grow when its special requirements came around, so it had to remain dormant for a more propitious occasion.

Spiræa Van Houttei.—Frequent praise is bestowed on various spiræas, and, in fact, as a whole they are indispensable among shrubs. But it is seldom that *Van Houttei* is mentioned. In the writer's estimation,—and many others would willingly concede its worth,—it is the best of the shrubby spiræas. It is supposed to be a hybrid, but its parents are not positively known. But from the foliage and flowers, one would pick out *Reevesiana* (*cantoniensis*) as a possible parent. In grace and beauty, it far surpasses the one mentioned by its part-pendulous habit, forming a beautiful, symmetrical specimen with a maximum height of six feet, and fully the same breadth. The leaves have considerable resemblance to the Maiden-hair Fern, which at once speaks favorably for it.

Clivia nobilis.—Among the most satisfactory of all plants for conservatory decoration are *Clivia nobilis* and its near relative *Clivia miniata*, the latter sometimes known as *Imatophyllum miniatum*. They are fleshy-rooted plants, but continue to increase in the number of offsets from year to year, with increasing showiness each year. One of the finest specimens we have heard of is being grown by Mrs. J. B. Park, of Greensboro, Georgia. It has seven flower stems, and when it is remembered that these stems bear umbels of from 15 to 30 flowers, the brilliant orange mass is gorgeous in the extreme. It is from South Africa, and of easy culture.

The Australian Pepper Tree.—The Australian pepper tree,—botanically known as *Schinus Molle*,—is one of the most popular shade trees of California. The leaves have been found desirable for decoration by Eastern florists,—and a good trade in them with California has sprung up.

Dead Patches in Tree Bark.—The bark of some maples as well as that of some apple trees, which are all young and thrifty, about 20 years' old, is decaying and falling off. Some trunks of maple trees are completely denuded of bark and the wood appears to decay; but the trees themselves are, to all appearance, thrifty and making a fine growth. What can be the cause of the trouble? There is evidently a fungus present, and I propose to cover all diseased spots and naked wood with a mixture of cow dung, clay and bordeaux mixture, covering the same with mosquito netting to keep it intact, thus keeping the air from the wood. Can you suggest a better remedy?

Cloverley.

Dead patches, at times of considerable extent, often exist in trees, and are unobserved when once the trunk is covered by rough bark. This is usually the work of a parasitic fungus, that spreads by its cob-webby spawn, and kills as it goes. Occasionally, it fructifies, and in this mushroomy condition may be seen on the surface telling the sorry story of what may have been going on within. Its presence may, however, be known to close observers, by the paler leaves on the affected trees than on neighboring ones of the same species. A closer examination of the tree may then show that some portion of the trunk is not uniformly round. Then tapping the flattened portion with a knife handle, the sound indicates hollowness. This is the dead part.

All that can be done in these cases is what our correspondent is doing, cut away all the dead portion of bark until the living is reached,—then wash the exposed part with some fungicide, and finally painting or covering with some material, such as dissolved shellac, to keep out the weather and prevent decay in the old wood, until there has been time for the new wood and bark, from the border line, to cover the wound.

Clover for Manure.—In the report of Dr. Wm. Saunders, Director of the Dominion Experimental Farms, he says:—

"The experiments which have been conducted in the growing of clover to plough under to enrich the soil and add humus to the land have shown that clover can be sown with wheat, barley and oats without lessening the grain crop for the current year. They have also shown that when ten pounds of red clover seed is used per acre, sown with the grain, and a fair catch is the result, the clover after the grain is cut makes a vigorous growth, serves the purpose of a catch crop during the summer, gathers a large quantity of nitrogen from the air and stores this up in its leaves, stems and roots; that the roots range far and deep to gather food, going deeper than most other plants can go, and converting considerable quantities of unavailable plant food into available forms. The stores of nutritive material so gathered are, when the crop is ploughed under, of great advantage to the land and add materially to its fertility. The experience of another year has added fresh testimony along this line and confirmed these conclusions."

Raising New Varieties of Roses.—For those who desire to experiment with raising new varieties of roses, a variety, known as General Jacqueminot, is almost essential. The pollen has strong tendency, and the pistils are also healthy and vigorous to such an extent that it frequently bears abundant seed vessels of its own. It can therefor play an important part either as a male or female parent in crossing for new varieties. There are some roses that it would be very desirable to improve; but, on account of lack of vitality in some of the organs, it is impossible to improve. The common Crimson Boursault is one of this character. Any one who would take it in hand to improve, and really effected an improvement, would make his fortune. It is of the hardiest of our roses, and yet of a very remarkably vigorous character. When in bloom with its multitude of bright crimson flowers, it is a source of genuine pleasure to the lover of roses. But it cannot be improved because its stamens are always without perfect pollen. The anthers are there, but they do not produce a single pollen grain. If, however, it was taken in hand by some enthusiastic rose grower, the pollen of some strong hardy variety used to fertilize the flowers, it might possibly be improved,—indeed, the probabilities are all in its favor. The raising of new roses, at any rate, is very interesting employment, and the American gardener would find it to aid materially to his gardening pleasures.

Tea Culture.—Attention is again being given to the propriety of extending tea culture in America. The plants thrive as well along the lines of the Allegheny Mountains as they do in their native country. About this, there is no need for any further experiments by the Government Stations. What is needed, however, is to find out how to gather the leaves and prepare them as cheaply as they do in China. It is said we can have Chinamen here to do the same work for us that they do in their own native land, but it is found that when a Chinaman emigrates to this country, he soon finds out that his labor is "alle samme Melican man."

Sociable Horticulture.—The social features inaugurated by the Alton (Ills.) Horticultural Society, nearly half a century ago, has been one of the causes of its vigorous longevity. The monthly meetings are held at the home of some one member, where the teachings of the society are practically illustrated. To this society may be attributed the honor of making plum culture a marked success, by simply shaking the trees and capturing the curculio.

NEW OR RARE PLANTS.

RUDBECKIA GOLDEN GLOW.—The history of that beautiful herbaceous plant, Rudbeckia Golden Glow, is thus given by the Rev. C. Wolley Dod, in the London *Journal of Horticulture:*

"With your remarks on page 363 concerning the merits of this as an ornamental plant, I quite agree, but it is not a very new plant to English gardens. It was introduced from North America nearly twenty years ago by Messrs. Smith of St. John's Nurseries, Worcester, and offered in their catalogue by the name of *Rudbeckia lævigata;* thence it came into my garden, and though it does not increase fast, it has had time to find its way into most of the cottage gardens in the parish.

I sent the plant some years ago to Kew for identification, and it was there considered to be a variety of *R. laciniata*, though it differs in many respects from the type of that species. Asa Gray, in his "Flora of North America," considers *R. lævigata* of Pursh to be a dwarf form (a foot or two high) of *R. laciniata*, though he does not seem to know the variety. Our plant does not fit any *Rudbeckia* described by Asa Gray. Perhaps it may be a hybrid, say between *R. laciniata* and *R. pinnata*, or *R. maxima*. This seems more likely, as I have never been able to find or hear of a fertile seed on the plant, whilst *R. laciniata* ripens seeds freely in English gardens. It was figured in *The Garden* as *R. nitida*, a species the characters of which it will not fit, though that, too, has a var. *lævigata* (Nuttal), said to be distinct from the *R. lævigata* of Pursh.

The provisional name, Rudbeckia Golden Glow, is safer than a conjectural specific name; but I think I have seen it in Barr's catalogue called Autumn Glory, and it would be well to obtain consistency in these fancy names. The flowers last remarkably long, often well into November, and few plants make so large a show from so small a base; it has also the merit of flourishing for many years in the same spot without interference."

Aside from the interesting sketch of its origin, it will be noted that the genial old gentleman still carries along the fiction of the last generation, that hybrids are necessarily sterile. In the light of what his own countrymen are doing in orchids, and many other things, it is surprising how the old notion sticks. Compositæ, with tubular disk flowers, do not seed when they become strap-shaped or, as we say in gardening, double—and this is because the sexual organs become purely pistillate, instead of hermaphrodite, as when in the normal condition. Instead of being impotent, they seed freely when pollen is permitted them.

It is surprising, also, to read the statement "It does not increase fast." In America, a small off-shoot set out one year will be an immense stool the next.

THE HARDY FLOWER GARDEN.

TRANSPLANTING ROSES.—The natural season for transplanting roses is the spring, though with due precaution, they may be safely handled in the early fall. Some are more susceptible to cold than others; and all object seriously to careless treatment.

Most young roses are scantily rooted, which necessitates a severe pruning of the tops in transplanting. Three or four inches of healthy young growth is all-sufficient to leave. The wood shrivels and weakens if the roots be exposed very long, hence when received from the nursery they should be at once planted out or heeled in.

Some roses are budded or grafted on a strong-growing stock; while others are on own roots. The former require watching to prevent suckering from the stock, which soon robs the plant of its vitality. To lessen the effect of such a contingency, it is wise to set the plant deep enough that the junction of the graft or budded portion may be covered, that it may be allowed to throw out roots for its own support. Manetti, Dog, and Multiflora roses are the most common stocks, and may be usually readily distinguished from the cion. At times, buds will be present on the stock. If they be rubbed off before the plant is set, immediate sprouting will be prevented.

With most roses, particularly the hybrid remontant varieties, a deep, rich soil is requisite for good results. Roses planted in sod will prove failures. Make a bed for them, dug two or three feet in depth and made rich with manure—cow manure is excellent. Do all that is possible to encourage a strong heavy growth, and to this end let the bed be located in the full sunlight, away from large trees.

The hardy, common roses are perhaps less particular, though they show appreciation for care. The beautiful trailing rose, Wichuraiana, is adapted for almost any situation, on margin of beds, on banks and rockeries, or can be trained to a trellis or stake. The abundance of pretty flowers which it presents calls forth the following remark from an ardent lover of gardening: "I welcome the hybrids of Wichuraiana. I have a bed, 12 feet in diameter, of the type, that takes ten years off the age of any man each time he looks at it."

FRUITS AND VEGETABLES.

THE ANJOU PEAR.—The tendency of the modern English-speaking peoples is to shorten words and titles. Hence it has come about that the famous old French pear, Beurre d' Anjou, in practice has been deprived of the forepart of its original name.

It was originally, and yet stands, at the head of the list of pears, as a first-class, all-round variety, though it has so long been known that its early history is lost.

The fifth annual report of the Fruit Experiment Station of Ontario, from which we secured our picture, regards it as rather of Belgian than French origin, and gives the date of its discovery as about 1823. In our own country it seldom reaches the size given in our picture, though Ellwanger & Barry, of Rochester, N.Y., usually surprise their friends with samples quite as good when the Novembers come around. Though many varieties seem to have local preferences, the Anjou is reported as doing well wherever pear-growing is a success.

ANJOU PEAR.

CHESTNUTS FOR WINTER USE.—A good plan for storing chestnuts for winter use is to place a small quantity of salt in the bags with the nuts. They will then become soft and sweet, and any worms which may happen to be among them will be driven out. The bags will become covered with sweat, caused by the salt, but this will not impair the quality of the nuts in the slightest degree. This plan is followed by many persons and is considered one of the best.—*Public Spirit*, Hatboro.

PREPARATION OF PERSIMMONS IN JAPAN.—We give the following information from an interesting report of the Agricultural Mission in the extreme Orient, by M. Rouget, vice-president of the Horticultural Society in Hyeres:

"*Diospyros Kaki*, of which there is a considerable number of varieties, may be divided into two great sections. The first comprises fruits of a pronounced astringency; the second is sweet fruits. Fruits of the first section are

scarcely edible fresh, and are submitted to the following special preparation: Heap them in a cask containing good brandied rice; press as closely as possible, at once turning up the other end of the cask, which must be pierced with holes above a litre (1.760 pints) of brandied rice, repeatedly each day for three weeks. The alcohol is not lost; it is received from a bung-hole in the lower part, but is unfit for use, because of the acrid property of the fruit. Finally, the persimmons are taken out, dried in the sun, and put in boxes the same manner as figs.

Sweet persimmons may be immediately dried in the sun, therefore they are gathered with care a short time before they are ripe, when the flesh will feel soft to the finger; they are hung in pairs, by passing a pin through the stem, and fastening to a very flexible reed and laid on bamboo stalks. It is not necessary that they be exposed directly to the sun; they may be put in a warm place, near a wall, shielded from the sun's rays by a straw mat of reversible mesh.

At the end of twenty days, the fruit, although hard at first, has become soft and sweet, and diminished one-half its size. The time for boxing it is when no hardness remains, and the pit may be easily pressed out by the fingers; it is then flattened and boxed. A slight fermentation is produced, causing the sugar to ooze from the fruit. Persimmons thus prepared will keep for a year."

Translated by Sarah D. Lanning from *Lyon Horticole*.

PLANTING TREES TOO DEEP.—I had occasion to dig up three small peach trees, as they were in the way of the plow. To all appearances, they had been planted two years. The tops had been broken down by stock, and they had one summer's growth on them,—a bushy growth, made last year. Most of this growth was allowed to remain, cutting out the leading, inside shoots. In removing them, I found that they had been planted *one foot too deep* in the ground, and that they had thrown out surface roots near the top of the ground. As the surface roots were good ones on two of the trees, I planted them at the same depth that they had occupied. The third one I planted, after cutting away the small surface roots, at the depth it should have been planted two years before. As I was planting these trees, it occurred to me that possibly you may instruct myself and others on a point or two. These points are as follows:

As I understand it, the sub-soil roots or tap roots are those which occupy the sub-soil and draw their nourishment from the sub-soil. They also serve as anchors to the tree. The surface roots draw their nourishment from the surface soil and also serve as braces to hold the tree to a vertical position against the winds. Now here are two classes of roots to every tree. They each have certain functions to fill. To digress a little, all horticulturists and books say: "When filling in the earth around the tree roots, place the surface soil at the bottom of the hole and the sub-soil around the surface roots at the top of the hole." Does this look to you all right? This is the point which I wish you to consider. It does not look right to me, for the sub-soil roots are used to the sub-soil, and for which they were created to occupy, and the surface roots for the surface soil. The two soils are dissimilar in every way.

I send you a newspaper clipping. I find that the peach limbs are brown inside; that "I hallowed before I got out of the woods." I was "too previous." The tops of all the hardy rose-bushes are killed and black to the snow-line. Twenty-two degrees below zero is the coldest weather that I have ever partaken of knowingly. F. K. STEELE.

The points suggested by our correspondent are in the main correct. Plants are enabled to make use of manure and fertilizers only by the aid of the oxygen of the atmosphere. Food placed near the surface of the ground is, therefore, better oxidized than when placed where the atmosphere cannot reach it. The object of plowing or loosening the soil is to ærate it, or, we may say, to supply it with oxygen to operate on the food.

Another interesting point in the history of plant-life is, that root fibres multiply in proportion to the supply of food at command. Fibres are not produced where there is no work for them to do. Fibres are not produced from the main roots deep in the ground, because there is no food for them to work on. Fibres are formed abundantly near the surface, because there is where the feeding is mainly done.

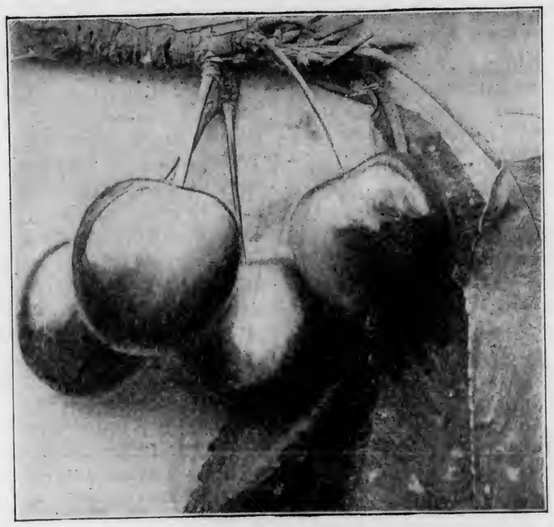
The deeper roots send out the annual working fibres where there is food. Putting the surface soil at the bottom of the hole incites the fibrous growth as long as the earth continues ærated, and, what is of still more consequence, the surface soil remains ærated longer than compact earth would do, and by capillary attraction draws moisture from the more compact material. It is in a sense a reservoir of moisture during a dry spell of weather.

In planting, holes should be made deep, and filled with porous material to form reservoirs of air and moisture; but the trees should be planted with the feeding roots as near the surface as compatible, with a firm pressure of the soil about them.

MANNA OF SCRIPTURE.—The manna referred to in the history of the wandering of the Jews towards Canaan, is believed to be a species of small puff-ball, which is still found on the Arabian deserts, and behaves precisely as detailed in the Jewish history. Its botanical name is *Canona esculenta*. It is about the size of a pea, but comes out in such numbers as to be often in small heaps. It must be collected in early morning, as it dries up and disappears before night. It can, however, be kept for some time if preserved from evaporation. It appears after heavy dews, or the rains that fall occasionally in the deserts. Nearly half its weight consists of nutritious matters, fit for human food.

COVERING RASPBERRIES.—F. S. writes: "In reference to raspberry canes, do you think it better to turn them down (cover with soil); or would tying them together and mulching the roots answer as well?" There are a few varieties that are not perfectly hardy, and should be put down in the Northern States; but these (mostly European) are so seldom cultivated in our gardens, that it is safe to say, generally, that covering is not necessary. There are some varieties called hardy that may receive partial injury, yet not affect the crop as a whole. Experience with some covered and some not would demonstrate this. Bunching up the canes is a slight protection.

CHERRY — NAPOLEON BIGARREAU. — There are many excellent varieties of fruit that do remarkably well in limited areas, and it becomes the province of our Pomological Society to note the special localities where the several varieties thrive. But there are kinds that do well everywhere, and which it is always safe for the unskilled to plant. Among cherries, the Napoleon is one of this class. Its origin is unknown. Though with a French name, there is room for believing it is a German production. In California it is known as the Royal Ann, and is the leading Californian cherry as seen in our Eastern market. It thrives in the Atlantic region as well as on the Pacific. In Canada it ranks as one of the best,—indeed, we have been tempted to this notice by an illustration in the report of the Ontario Experiment Station, wherein it receives high praise.



NAPOLEON BIGARREAU.

INTRODUCER OF ELBERTA PEACH. — Attention is called to an error in the August issue where Mr. Hale is named as the introducer of the Elberta peach. Mr. Samuel Rumph, Marshallville, Ga., raised and introduced it.

BIOGRAPHY AND LITERATURE.

OCTOBER.

Ay, thou art welcome, heaven's delicious breath,
When woods begin to wear the crimson leaf,
And suns grow meek, and the meek suns grow brief,
And the year smiles as it draws near its death.

Wind of the sunny South! O, still delay
In the gay woods and in the golden air;
Like to a good old age released from care,
Journeying in long serenity away.

In such a bright, late quiet, would that I
Might wear out life, like thee, 'mid bowers and brooks;
And, dearer yet, the sunshine of kind looks,
And music of kind voices ever nigh;
And when my last sand twinkled in the glass,
Pass silently from men, as thou dost pass.

—BRYANT.

BENJAMIN G. SMITH.—Some days after our August number appeared, a cordial letter was received from Mr. Benjamin G. Smith, of Cambridge, Mass., endorsing a statement made in MEEHANS' MONTHLY, that to cultivate a love of gardening through life was one of the best provisions for happy old age.

He referred to his being in his 84th year, and that the greatest pleasure of his life was in his garden. He felt that his fulness of years, and strong health was in a measure due to his love of gardening. It is a sad commentary on the uncertainty of human life, that for all this happy disposition his heart suddenly gave out on August 22nd, and ceased to beat on the 24th.

The Massachusetts Horticultural Society, the American Pomological Society, and many similar associations, will mourn his loss as one of the brightest examples in amateur gardening.

HENRY L. DE VILMORIN.—The head of the famous firm of Vilmorin-Andrieux & Co., of Paris, H. L. de Vilmorin, died suddenly on August 22nd, in his 56th year. He was the great grandson of the founder of the firm which had its rise over 150 years ago. The whole series has been remarkable men, not the least, by any means, being the one horticulture has now lost. He was one of the foreign commissioners to our Columbian Exposition, and won the esteem and admiration of all who came into contact with him, by reason of his affability, broad intelligence, and unselfish devotion to the cause.

LANDSCAPE GARDENING,—by F. A. Waugh, published by Orange Judd Co., New York. It costs no more to have one's home beautiful, than to have it neglected. It often costs less. The number of treatises, helping the good work of beautifying one's home, follow each other so frequently, as to show a growing development of the lovely art. This little work is one of the best. It is a good story, briefly told, and will be of value to all, no matter how limited their aspirations for the beautiful may be.

GINSENG,—by Maurice G. Kains. Published by the Orange Judd Co., New York. The heavy demand, by China, for American ginseng roots, will probably last for many years to come. The wild plant is getting scarce. It should be a profitable article for farm culture. This cheap and yet beautifully illustrated booklet covers the whole ground of culture.

THE WILLOW OAK.—Mr. W. R. Smith says of *Quercus Phellos*:

"President Jefferson's favorite tree was the Willow Oak, his enthusiasm for which is graphically narrated by his biographer, R. S. Raynor. Unless well supplied with food it grows slowly. A few are planted on the street in front of the Treasury Building, Washington, D. C. We would recommend groves of it be planted in the various parks or public places throughout the country by its admirers, each individual planting a tree; none to be allowed to plant one who has not reached his high intellectual plane of love for trees. A magnificent specimen stands as a sentinel near the monument of that intellectual aristocrat and truly great and good man, Professor Henry. It is seventy feet high and eleven feet in circumference six inches from the ground."

JOURNAL OF THE COLUMBUS (O.) HORTICULTURAL SOCIETY.—Formerly, members of Horticultural Societies depended wholly on the exhibitions for instruction,—some of the leading modern institutions give, in addition, "Proceedings" with matter of great value to the members. The Columbus (O.) Society's Journal is always instructive. The present issue has an able paper on the commercial value of forced rhubarb, and the flower lover is treated to a chapter on the distribution of plants over the surface of the earth.

PROGRESS OF HORTICULTURE.—The number of bulletins, pamphlets, reports, and papers on horticulture, botany and the kindred sciences that are being issued in these days is astounding. National, State and even city governments, and societies innumerable have their issues mostly filled with valuable facts. But they are too numerous to mention, and most of the editions pass away unread for sheer want of time. Many of these go over and over again what has been already recorded. It is to be regretted that there is not some society with the necessary means at command to annually index the subjects treated.

THE COLORS OF FLOWERS.—That all flowers were originally green, may be accepted as an abstract proposition. Considering that, morphologically, the floral parts are but modified leaf-blade, is a proposition that may be accepted,—but that the change to brilliant colors was brought about by insect agency, may well be questioned. The hypothesis of Grant Allen and similar reasoners, that there never would have been colored flowers, had not the visits of insects been of benefit for cross-fertilization, stands on the slenderest foundation.

As against this view, Mr. E. Williams Hervey has brought together a large number of facts, and detailed them in a hundred-page work. The interest in the relation between insects and flowers is wide-spread, and Mr. Hervey's work should be read by all who desire to get a clear understanding of this topic. He has arranged with H. S. Hutchinson & Co., New Bedford, Mass., to supply copies at 75 cents each.

FLORIDA.—As to why Ponce de Leon gave the name Florida to the territory now known by that name, the Florida *Farmer and Fruit Grower* quotes from an old book published in 1763: "Gave it the name of Florida because it was first seen in Easter, called *Pasqua de flores* in the language of his country, or as Herrera alleges, because it was covered with flowers and the most beautiful blossoms." And the *Farmer* adds: "Those who have seen the Easter season in Florida and the wealth of flowers which still commemorate and adorn its return, can well believe that both these reasons influenced the giving of its name."

ELEVATING INFLUENCE OF GARDENING.—In an address before the Peoria (Ills.) Scientific Association, Dr. J. T. Stewart gives the following beautiful sentiments:—

"The cultivation of ornamental plants is one of the distinguishing marks of civilization. Search the world over and you will not find among the lower order of people a single flower, tree, or shrub cultivated for ornament or even for shade.

Nature is the great teacher—the elevator of man; but man must rise to a certain degree before he will hear her voice. Then her influence is all pervading. Then her power for elevating and refining is unbounded. Then the myriads of opening buds, the unfolding leaves, the bursting flowers, the green fields, lift the soul from earth to heaven.

It is scientifically true that when we have advanced far enough to see and appreciate nature, she will then permeate us, lift us up, refine and elevate us in the scale of being. What better can we do? What better can the Scientific Association do, than to learn ourselves, and teach others the beneficent influence nature has over us, if we will but put ourselves in unison with, and learn of her. No man is so poor he cannot do this. No man is so rich he can afford not to do it. Every house should have some of nature's favorites growing in and around it."

GENERAL NOTES.

FLIES.—The head-lines of the great daily newspapers are marvels in their way. One from Chicago in magnificent type tells us "Electricity may banish flies. Automobiles may give relief." It goes on to say that when the automobiles—"Tommies" the street Arabs of Philadelphia call them—have banished all the horses, there will be no horse manure in which they can lay their eggs,—and when the house-fly lays no more eggs the race will die out.

Naturalists look to the supply of food as governing the abundance of life. Creatures will find the nesting places. They readily suit themselves to conditions if they can get enough to eat. It is to be believed that faith in the "Tommies" will be in vain, and that the price of fly-paper will not fall for a long time yet.

FRUIT AND MEDICINE.—"Fruit," says *Modern Medicine*, "is chiefly water, the amount of nutrient material it contains varying from five to eight or ten per cent. in most fruits, rising to a higher figure only in dried fruits, such as dried grapes, prunes, dates, etc. The writer has succeeded in reducing excessive weight in the most satisfactory manner by prescribing a diet consisting almost exclusively of grapes or apples, allowing only a small bit of thoroughly dried bread or zweiback in connection with the fruit. In some cases the fruit may be allowed as often as three or four times a day, to relieve a sensation of emptiness.

Remembering the interesting fact pointed out by Bouchard, that rheumatism is really a toxemia, resulting from the decomposition of food stuffs in a dilated or prolapsed stomach, we may also attribute the beneficial effects of a fruit diet in rheumatism and allied conditions to its value in suppressing the formation of poisonous substances in the alimentary canal."

We must remember that an article in a magazine is but the opinion of one person,—and that in medical magazines, especially, we find the truth of the saying that "doctors differ." In practice, the last thing taken is too often regarded as the cure. A large series of observations is necessary before a fair deduction can be made. In relation to the use of natural fruits in rheumatism, it may be said, however, that there is good reason for the belief that they are very useful.

INDIAN CULTIVATORS OF THE SOIL.—Those, who contend that the Indian is incapable of becoming a good agriculturist, take their cue from a few isolated cases. In most cases where failure has been recorded, the failure comes more from the inability or incapacity of those who are appointed by the Government to lead them. Whoever has had the opportunity of travelling through the country settled by the Cherokees and Choctaws, must have seen quite as frequent evidence of agricultural success among those people as could be seen among white people anywhere. It is, however, to be suggested that this is chiefly on account of the country being more favorable to agriculture than localities further north. But we learn, from the Helena *Independent*, that the Crow Indians are rapidly advancing in industrial agriculture. Crops have been raised, in the Crow region, chiefly by irrigation. In less than ten years, these Indians have constructed eight large irrigating canals, sufficient to irrigate from two thousand to ten thousand acres each, and are now working on another that is even larger. It is to extend for probably fifty miles. A few white men are employed as skilled artisans by the Indians; but the work itself is done by them. It is said that they are remarkably thrifty, not spending all their money, but saving some which is invested in truly sensible and business ways.

AMERICAN NURSERY INTERESTS.—Over 1000 nursery and seedsmen and fruit growers in Germany have petitioned the Government for a protective tariff against American horticultural productions.

HIBISCUS MILITARIS.

THE SOLDIERLY HIBISCUS.

NATURAL ORDER, MALVACEÆ

HIBISCUS MILITARIS, Cavanilles.—Smooth; leaves thin, on long and slender petioles, serrate, slightly cordate, the lower ones roundish, three to five-lobed, the upper ovate-lanceolate, entire or somewhat hastate, with rounded lobes; peduncles shorter than the petioles; calyx inflated; corolla tubular-campanulate, pale rose color with a red centre; seeds silky. Stems three to four feet high. Leaves three to five inches long. Corolla two and a half inches long. Chapman's *Flora of the Southern United States*. See also Gray's *Manual of the Botany of the Northern United States*, Wood's *Class-Book of Botany*, and Britton and Brown's *Illustrated Flora*.

The plants of the great mallow family, to which *Hibiscus* belongs, have attracted the attention of polite writers by the ephemeral character of the flowers. They mostly last but a day, and some species open in the morning and begin to wither before night-fall. But they are mostly beautiful; and, for all the fleeting nature of their charms, are generally admired. They have come to be emblematical of transient beauty as often met with in our daily lives. Mrs. William Wirt suggests that Shakespeare must have had some kind of mallow in mind when he penned these lines :—

"Beauty is but a vain, a fleeting good,
A shining glass that fadeth suddenly;
A flow'r that dies when almost in the bud,
A brittle glass that breaketh presently.
A fleeting good, a gloss, a glass, a flow'r
Lost, faded, broken, dead, within an hour."

But generally the flowers are produced in such rapid succession, that the transient character of each is scarcely noticed. The species here illustrated, for instance, usually throws up a number of flower-stalks from a single root-stock, and maintains a brilliant show of blossoms from the end of summer till the end of autumn. It is, indeed, one of the gayest of our wild flowers. It was probably from this showy appearance that the Spanish botanist, Cavanilles, gave it the specific name of *militaris*, as indicating a gay, soldierly bearing.

The flowers of *Hibiscus militaris* commence to unfold their petals about two hours after sunrise, and face the southeast while doing so. This has been found to be the case with many of our wild flowers whose time of active growth is at that hour of the day. The reason for this is probably to be found in the action of the sun's rays. The side of the flower receiving the warm rays may be encouraged to a more rapid development than the shadier side, and the bend would be in that direction, consequently. No actual experiment has, however, been recorded, though shading some of the opening flowers could easily be effected. The only absolute fact is that the opening flowers face the point indicated. Another interesting fact, in connection with the life-history of our plant, is the change in the direction of the spiral twist when the petals begin to fade. This has long been noticed in connection with the leaves of plants, and is then technically known as antidromy. One might suppose that a flower, represented as the one in the plate appears, with one petal convolutely over-lapping another while expanding, would only have to draw in on the same lines when closing for the withering stage. But, in this flower, it does not. The petal seen in the upper part of the picture as being in front of the other, gets behind when ready to wither, and the coiling then follows that direction. There is much more to be learned about the behavior of this plant, and it is a department of botany fraught with the highest interest.

In gardens, where *Hibiscus militaris* is grown in the vicinity of other species, such, for instance, as *Hibiscus Moscheutos*, *H. grandiflorus*, and *H. incanus*, seedling plants often show evidences of hybridization in their variations. The species varies considerably in its native localities, but under all its variations one can readily see that the main specific characters are present to enable one to identify the species; but in these garden cases, variations are found that indicate a relationship to its neighbors.

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COLOR PLATE
INTENTIONAL SECOND EXPOSURE

The natural variations are, however, very striking, and have led inexperienced botanists to name some of them as distinct species. Thus we find, in the botanies written during the earlier part of the century, *Hibiscus lævis*, *H. hastatus*, and *H. riparius*, all of which are now regarded as forms of one species. Walter, the southern botanist, writing in 1788, regarded it as *H. Virginicus*, which Linnæus had already described; but, that being an error, the name of Cavanilles, given in 1791, has been adopted. Sometimes, the seed-vessels are somewhat downy, and, at other times, smooth. The leaves, trilobed as seen in our picture, are often so divided the lobes are nearly equal, instead of being halberd-shaped,—that is, with the middle lobe much the longest, and the lateral lobes spreading. Some forms, which the author has seen, had the lateral lobes wholly absent, and all the leaves were simply narrowly lanceolate; while again, there are forms without lateral lobes, and the whole outline roundish-ovate. Much more is now allowed for variation by modern botanists than by the earlier ones; though, even to this day, striking variations are often regarded as involving hybridism. What is or is not a species, is simply the opinion of an expert; and one can scarcely be regarded as an expert, until experience has been had with the plant under many conditions. It is chiefly the lack of this experience that has loaded down botanical nomenclature with such a host of synonyms.

Most of the related species of *Hibiscus*, though attractive, when in full bloom, by their large and showy flowers, have a coarse vegetation which, at other seasons, detract from their beauty. But the subject of the present illustration has considerable gracefulness in comparison with the others. The stems, besides being more slender in growth, have a glaucous tint resembling that of its near relative, *Hibiscus incanus*. Like other members of the family, the bark is exceedingly tough in its fibre-like texture, and, on the ground of the author, is a favorite with the oriole for material wherewith to weave its beautiful nests.

In common with other malvaceous plants, *Hibiscus militaris* has points of special interest to the student of structural botany. Starting with the conception that all the parts of a plant are but leaf-blade modified; and that it is by the union, separation, rapid increase, or slow development that we have innumerable forms in plants, we see in *Hibiscus* that rapid increase and cohesion have had the chief part to perform in giving its character. The species, for the most part, have a circle of foliaceous organs beneath the calyx, which is known as the involucre (Fig. 2). These might have been leaves only for the sudden arrest of longitudinal growth. In the usual condition of arrested growth, five of these leaflets would have been formed; but the arrestation, in this case, must have been more than usually sudden, so that the whole coil took a lateral development as leaflets. The resumption of active growth, less intense at the start, gives us the five-lobed calyx (Fig. 3.) But here we see the cohesive force coming into activity, by the union of the leaf-parts to form this five-lobed character. A similar moderate move gives us the cycle of five petals. The next rhythm of growth is one of intense activity; greater even than the one which resulted in the production of the involucre, and the immense number of stamens, each one of which represents a modified leaf-blade, is the result. (Fig. 5.) Here, again, we see cohesion taking a prominent part in the formation of character, for the filaments have united to form a column, leaving only the anthers free. This great rhythm is followed by a comparative rest, which results in giving us a five-lobed capsule. The tendency to cohesion is not, however, confined to the primary floral leaves. It is not unusual to find the petioles and peduncles united for a considerable distance. The Fig. 4 in the plate shows this tendency in a small degree. In some cases there will be an inch or more of this peculiar union.

The studies here indicated, go far to add to the pleasures of the lover of our native flowers. In the present case, the lesson teaches us how, by mere variation in the degree of rhythmic force, genera and even natural orders are constructed by nature in the most simple way. A less vigorous rhythmic activity and a slighter cohesive character seems to have been her only method of establishing *Geraniaceæ* as a distinct order from *Malvaceæ*.

EXPLANATION OF THE PLATE.—1. Flowering shoots from a garden specimen, origin unknown. 2. The involucre. 3. The calyx. 4. Flower bud showing union of peduncle with petiole. 5. Opening flower showing the united column of stamens with the five-lobed stigma projecting from the apex.

WILD FLOWERS AND NATURE.

FOREST SONG.

A song for the beautiful trees,
  A song for the forest grand,
  The garden of God's own hand,
The pride of His centuries.
Hurrah! for the kingly oak,
  For the maple, the forest queen,
For the lords of the emerald cloak,
  For the ladies in living green.

For the beautiful trees a song
  The peers of a glorious realm,
  The linden, the ash, and the elm,
So brave and majestic and strong.
Hurrah! for the beech tree trim,
  For the hickory staunch at core,
For the locust, thorny and grim,
  For the silvery sycamore.

A song for the palm, the pine,
  And for every tree that grows,
  From the desolate zone of snows
To the zone of the burning line.
  Hurrah! for the warders proud
  Of the mountain-side and vale,
That challenge the lightning cloud,
  And buffet the stormy gale.

A song for the forest aisled,
  With its Gothic roof sublime,
  The solemn temple of Time,
Where man becometh a child,
As he lists to the anthem-roll
  Of the wind in the solitude,
The hymn that telleth his soul
  That God is the Lord of the wood.

So long as the rivers flow,
  So long as the mountains rise,
  May the forests sing to the skies,
And shelter the earth below.
Hurrah! for the beautiful trees!
  Hurrah! for the forest grand,
The pride of His centuries,
  The garden of God's own hand.

PROF. W. H. VENABLE.

This song was written expressly for Cincinnati "Arbor Day," 1882.

HIBISCUS MILITARIS.—In addition to the points detailed in the main chapter, the following may be added:—

Hibiscus militaris does not seem to have been well known to botanists until comparatively modern times, though a figure of a small branch appears in the Phytographia of Leonard Plukenet, which was published in London, in 1691. This, he says, he had "from the collection of Boisianus." Scopoli, a Swiss naturalist, figured the variety *lævis*, which was then supposed to be another species, in 1778. In 1791, Cavanilles described and figured the main form, known as *Hibiscus militaris*, with which the minor varieties have been subsequently united; but it was not till the early part of the century, when Michaux, Pursh, and others made a thorough exploration of the eastern part of our continent, that it became well known. In 1823, it was figured by Sims, in the "Botanical Magazine," who gives the following account of it: "*Hibiscus militaris* is a native of the banks of rivers in Louisiana (then most of our western territory) and the western part of Pennsylvania and Carolina, where it flowers in August and September. It is said, by Pursh, to have purple flowers; but all the species in the collection of Spofforth, from whom our specimen was taken, are invariably white with a red centre." So far as the purple flowers are concerned, it may be noted that towards evening, when fading, the purplish tint is prominent.

The change in color, when fading, is characteristic of many of the species of *Hibiscus*, and to such an extent, in some instances, as to attract the attention of polite writers. It is often referred to as among the peculiar characteristics of vegetable nature.

TREES OF THE PACIFIC COAST.—Next to the "sounding sea," are the "dim aisles of the forest," for filling the whole being with new life. The salt sea breeze, the undulating waves of the ocean and the pine clad forest both bring us into a sanctuary, where we listen and almost hold our breath lest we mar the more than mortal speech of the whispering waves or the sighing leaves. 'Tis grand to be for a time on the briny deep and quaff the pure air, or to be on mountain tops and inhale the very breath of the growing trees and fill the whole being

with newness of life. Let us be grateful for the breeze of ocean and for the breath of the mountain pine.

After coming to California, we had seen no running water or fir trees until we took a camping trip to the mountains.

"A glowing scene of leaves and water and light," one might well exclaim upon Cayamaca Mountains, where running water made music, and various kinds of mistletoe with their pearl-like fruit adorned the oaks, cedars and pines.

In the tenth United States census report, there are given thirteen species of pines as growing East of the Mississippi River; twenty-three oaks, six maples, four elms, seven magnolias, eight hickories, and six species of ash. MRS. E. E. ORCUTT.

San Diego, California.

SOLIDAGO ODORA, AITON.—Sweet Golden-Rod, Blue Mountain Tea. Stem slender, from two to three feet high, nearly smooth, often reclining, leaves linear-lanceolate, pellucid, dotted, emitting a pleasant odor when bruised. Racemes in small, one-sided panicle.

This plant was first brought to my notice in 1857, by a gentleman residing in Conestoga Valley, who collected it for medical purposes, in one of Clark's meadows, situated near Jones' Iron Mine, in Berks County, Pennsylvania. The place is now known as Kenney's Station, on the Wilmington and Reading Railroad. In 1869, it was reported growing below Peach Bottom, where it was again collected in different years from 1880 to 1890. In 1884, it was found growing on a spur of Chestnut Hill, and in 1892, on an island in the Susquehanna River, near Fite's Eddey, Lancaster County, Pennsylvania. In 1891, it was again collected on an elevated part of the mountain near Mt. Hope Furnace. The people living in the neighborhood used it for medicinal purposes. One gentleman informed me that he owed his recovery to health after a severe sickness, to drinking tea made of the stem and leaves of it.

I have several circles of it growing in our yard in Lancaster, brought from the different localities in which I found it in its wild state.

Lancaster, Pa. AMELIA F. EBY.

Golden-Rods are now becoming favorites for garden culture,—and the Sweet Golden-Rod is, as our correspondent notes, one of the most desirable for the purpose. It is very common in New Jersey woods, and is readily detected by the odor of crushed leaves.

A few years ago, the dried leaves, used as tea, were quite an article of commerce.

IN WINTER'S WILD GARDEN.—Most of the petals are shut, for this is not the season of "the soft west wind wandering at its ease." We are en route to the months of frost and snow. Let us fill up the acorn cups and drink to the health of the winter. If we use our eyes well we can still find some green leaves and red berries to brighten the coldest day. Once, Richard Jeffries gathered twenty-six flowers on October 19th, in a hilly English country; but how small our visiting list is; how few flowers we know; how seldom we go to their homes; and it is our loss. Little aristocrats of the fields, they care not,—besides, they hate our picking, stealing ways, and fear us as vegetarians, for not a few old folks have gathered Wood Betony for herb tea; and have eaten dandelion leaves between slices of dry toast. And, like the Spanish Fleet, the Witch Hazel finds itself bottled up awaiting orders from the American people. Could anything be more unpleasant? How many of us know that the dandelion changes its color in the autumn, and is pale? But surely all know that it can be seen almost any time during the year, with its brave little head full of sunshine.

Clematis or Traveller's Joy turns into Old Man's Beard and "still journeys on the hedge." Partridge-berries are red for the birds, and in the marshes, stem after stem is full of color. That great favorite, the dog-wood, does its part well, only it blushes in the winter, and turns white when spring touches it again.

Once a dear little child asked if it was called Dog-wood because dogs loved it; but the answer was not loud enough to hear.

Wood-Sorrel can often be discovered, with its acid taste, folding its leaves at night like little hands in prayer. Bitter-sweet climbs the trees as long as it can hold on, and proves a good friend after it is brought indoors, often looking quite gay for a year or two.

Lubbock says, "ants carry violet seeds into their nests and so propagate them."

We mortals wish it were as easy to bring these fragrant flowers into our nooks; but they will not always do our bidding.

In wet places, the pitcher plant is full of muddy water, not only because it is sometimes Philadelphia water, but because it is a queer housekeeper, and likes untidy things, such as spiders and flies.

Thoreau says, "Give me the poverty that enjoys true wealth"—and he made himself rich, indeed, not with dollars and cents, but gold he had from nature and which he most gladly shared with all his friends. He was not like the pitcher plant, he loved things clear as crystal.

Like the asters, let us be among the last to enter the wintery land of Nod, slow to hide away under the frost and snow, and then with them let us patiently wait, with one eye open, for the Spring Beauties, and green banks of summer. E. W. L.

Elberon, N. J.

WOODY STRUCTURE OF TREES.—It has been clearly ascertained that the carbon which, when other elements are eliminated, we call charcoal, and which enters so largely into the structure of a tree, is taken from the atmosphere through the medium of the leaves; but how it is sent down the structure so as to add to the size of the most distant root, is yet an unsolved problem.

FRUITING OF THE SPANISH MOSS.—A Charleston, South Carolina, correspondent says:—"In looking over the descriptions, in Wood's and Darby's text books, of *Tillandsia usneoides*, nothing is said about its fruit. I was greatly interested, last winter and spring, in observing, in the gray moss of Summerville, and nearer our city, numerous capsules, long, narrow, horny, usually about three-quarters of an inch long; many seed pods (apparently of this character) and many sterile, withered flowers. I had never seen anything of the sort before. Was it unusual?

I had interesting samples to send you from beautiful Magnolia Gardens, twenty miles distant upon the Ashley River, from Middleton Place, the fine old Colonial seat of Arthur Middleton, Signer of the Declaration of American Independence, eight miles higher up the river from our Chicora Park, here on the Cooper River, and from Summerville; but it has gone the way of general rubbish, and I have but a poor fragment now left, which I gathered near or on Dr. C. U. Shepard's Tea farm, near Summerville. It escaped the fell swoop of the housemaid's broom by clinging to a splendid pine cone I picked up near Dr. Shepard's residence. Break open the pod and observe the pappus or something similar to the 'down' of a composite. I would like to know if the *Tillandsia* really does fruit and just how it is propagated."

So far as the writer's experience goes, the Spanish Moss seeds freely in most parts of the South, whatever it may do in the vicinity of Charleston. In examinations made in the South, the small seeds were found sprouting on the smooth bark of orange trees; and small seedling plants noted on the branches of the Live Oak. It is not a parasite, but seems to attach itself to trees as a kind of anchorage. At least, this is the orthodox version of its behavior in life. But the writer believes that it does derive some nourishment by the attachment made to the bark. It does not penetrate, as a true parasite does, but may have the power of absorbing at the point of attachment from dead bark and other material. This is but a surmise, as opportunities for careful investigation have not been afforded the writer.

HYBRID OAKS.—Every once in a while, notes appear in botanical journals, describing hybrid oaks, and especially hybrids between the Black, Red, and Scarlet oaks. The writer has made oaks a close study for half a century, and never has had reason to suspect hybridity in any individual oak tree. That they vary, is true enough, just as variations may be found in Tulip Tree, Sweet Gum, and other monotypic genera where there is nothing to hybridize with. The fact is, that, for some reason as yet not well understood, hybrids in nature are extremely rare. Nature seems to have taken good care that the universal confusion that would occur from a general mixing up of things in her handiwork, as would occur should natural hybridization be easily effected, shall not take place.

JERSEY NUTMEG.—One common name for the tuberous roots of the *Smilax glauca* is "Jersey Nutmeg." I am not quite sure whether this originated with the old Jerseymen or with the newcomers here. Many species of Smilax have woody or tuberous roots. Briar pipes are from Smilax roots. W. F. BASSETT.

Hammonton, N. J.

GENERAL GARDENING.

WINTER'S APPROACH.

Autumnal leaves and flowerets! lingering last—
Pale sickly children of the waning year!
A lovelier race shall yet succeed ye here,
When nature, (her long wintry torpor past,)
O'er the brown woods and naked earth doth cast
Her vernal mantle.

—ANONYMOUS.

THE LIVE OAK, QUERCUS VIRENS.—With a pretty photograph of the celebrated Live Oak,

LIVE OAK.

in the Magnolia Cemetery in Charleston, South Carolina, kindly furnished by Superintendent Charles W. Stein, we have the following note concerning it :—

"I mail you a photograph of our pet Live Oak. It is a grand tree. It is twenty-one feet in circumference, covers an area of 10 x 192; superficial feet, 112 x 91; the largest limb is 9 feet in circumference and is 65 feet long. Its age is supposed to be between 500 and 1,000 years' old, it was here when Columbus discovered this country, and it is supposed that many a war conference has been held under it by the Indians; that they hung their dead in its branches, and that bears would run up and down it at their pleasure. There is no ten feet of it that is perfectly straight.

You will see the Superintendent sitting on the large limb, his daughter Mary at its trunk, his son, S. Lawrence Stein, Jr., assistant supt., on horseback."

When Michaux named this species of oak *virens*,—that is to say, "in vigorous youth," he could not have selected a better designation for a tree that bears its great age so well. The great Frenchman would have been enthusiastic at the sight of it. He says, "The Live Oak is commonly 40 or 45 feet in height, and

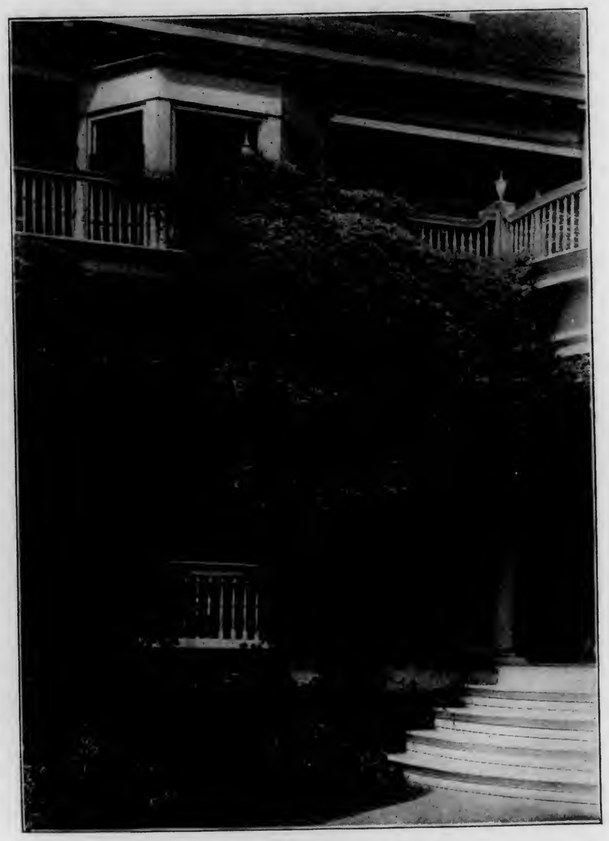
from one to two feet in diameter; but it is sometimes much larger. Mr. S., President of the Agricultural Society of Charleston, assured me that he had felled a trunk, hollowed by age, which was 24 feet in circumference." He regretted its disappearance for commercial uses, and prophesied that it would be practically extinct in 50 years.

We can get some idea of the age of a tree, by the measurement of its annual additions to the woody circle. It would be slow in age,—possibly not over one-eighth of an inch. Granting it to make a total of a quarter of an inch per year, this would make 1,152 years for a tree of 24 feet across. But in the earlier years of the life of the tree, there might be a quarter of an inch addition, or half an inch for the whole diameter. We may safely place 600 years as the minimum age of the tree Michaux referred to.

CLEMATIS PANICULATA.—What would flower lovers do without Japan? New and beautiful things from that country are looked for as regularly each year as the Fourth of July or Christmas Day. The present pretty climbing plant, *Clematis paniculata*, has long been known to botanists, having been described under the name it now bears by Thunberg, in his *Flora Japonica* issued in 1784; but it has been only of recent date that it has come into cultivation. He says that the Japanese call it *Kara Tade*, and that it is closely related to the American *Clematis Virginiana*; but has the leaflets attenuate, and not cordate; flowers cylindrical and not ovate,—and these flowers pedunculate. It is, however, in every way a handsomer plant than its American relative, and, besides, flowers much later. Thumberg says that, in Japan, it flowers during August and September, and it has retained this character in its new American home.

The accompanying illustration is from a specimen growing in Pelham, Philadelphia.

It may be as well to note here the proper pronunciation of *Clematis*, as practice varies much. The accent is on the first syllable, Clem'a-tis. It is a word of Grecian origin, and simply means a rope-like branch to bind with. Opinions differ as to the plant to which the name was originally applied. Modern herbalists supposed it to refer to some species of what we now know as *Clematis*, either *Clematis cirrhosa*, or *Clematis Vitalba*, both of which grow in Greece,—but Pliny, the Roman historian of natural history, seems to apply the name to some plant of the Apocynaceous family, as *Periploca* or *Vinca*. It is difficult, however, to identify positively, in many cases, the plants noted by the ancients.



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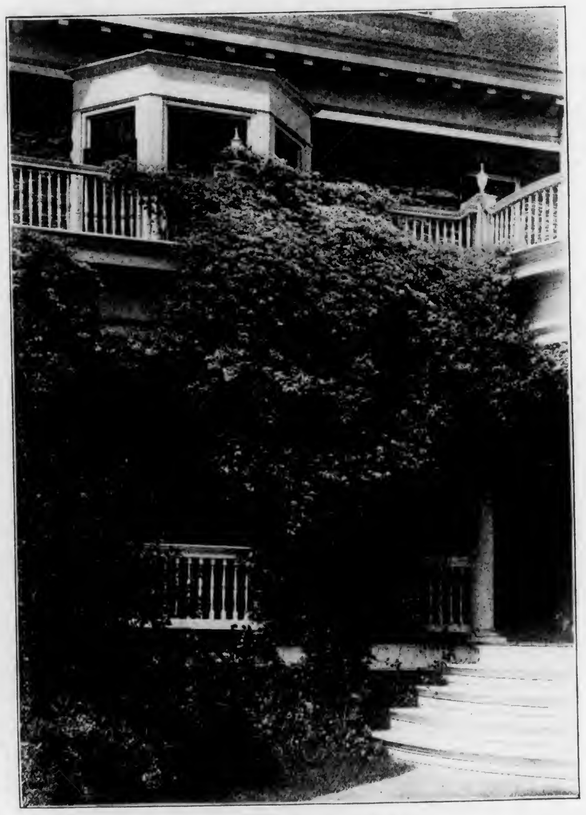

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INTENTIONAL SECOND EXPOSURE

GROWING THE MISTLETOE.—"I would like to be informed if mistletoe can be propagated, and if so, how? I have seen it growing in southern California, on both live and dead trees. I was told then, that the seed, or some kind of fungi, was carried by the wind, and where it lodged on trees, it attached itself to the branches and then grew there. Any information on this subject will be thankfully received."

New York. R. H. W.

The conductors do not know of any attempt to propagate the mistletoe in America.

In the Old World, it is said to be propagated by birds. They eat the sticky berries, and then clean their bills on the branches of trees. The sticky seeds, thus fastened to the branches, sprout and grow.

Seeds sown—as we may say—in this way, are, of course, subjected to the same laws as seeds of those plants that grow in the earth :—that is, there must be the conditions of temperature and moisture that the seed requires for germination. So far as known, these conditions, required by the mistletoe, have not been definitely ascertained. Actual experiment only could decide this.

TREES AND SHRUBS IN CANADA.—Canada seems to be very favorable to the growth of trees and shrubs, for all the supposed severity of its winters. In the catalogue of the Arboretum of the Experimental Farm at Ottawa, of which Dr. William Saunders is Dircctor, 3,071 species, that have been tested, are enumerated, the greater number of which are found to be quite at home there.

THE CAMPHOR TREE.—Mr. W. R. Smith says :—"It may interest you to know that the Camphor Tree (*Laurus Camphora*) is being planted as a street tree in New Orleans. A tree in a four-inch pot, presented to the beautiful niece of Mr. R. Maitre, the distinguished horticulturist of New Orleans, in 1883, is now thirty-five feet high and fifty-two inches in circumference at the butt. From this tree, we receive a liberal supply of seeds each year."

EUROPEAN SILVER LINDEN.—For those who like regularity in growth, few trees are more desirable than the European Silver Linden, a portrait of which, taken from a tree forty years' old, growing in the Meehan nurseries, is given herewith. In the ordinary forms of European Linden, the leaves are green on both sides. In this one, the upper surface is of a deeper green than usual, and bright silvery sheen characterizes the leaf below. It is often called Hungarian Linden, and is even classed as *Tilia alba* in some European works, as if it were a distinct species ; but the seeds from this tree produce as many plants of the common form of European Linden, as of the silvery-characteristic parent. In nurseries, it is propagated by grafting. The one illustrated was grafted on the common American Linden. It will be noted that the American stock, which forms about the lower half of the trunk, has not reached to nearly the girth of the European. Dendrologists may, therefore, safely say, that under equal conditions the European Linden is much more adapted to profitable timber culture than the American, so far as the single item of rapid growth is concerned.

The contrast between the dark and light surfaces of the leaves gives much pleasure to those who delight in ornamental foliage ; while the delightful odoriferous flowers are grateful alike to human beings and the bees.

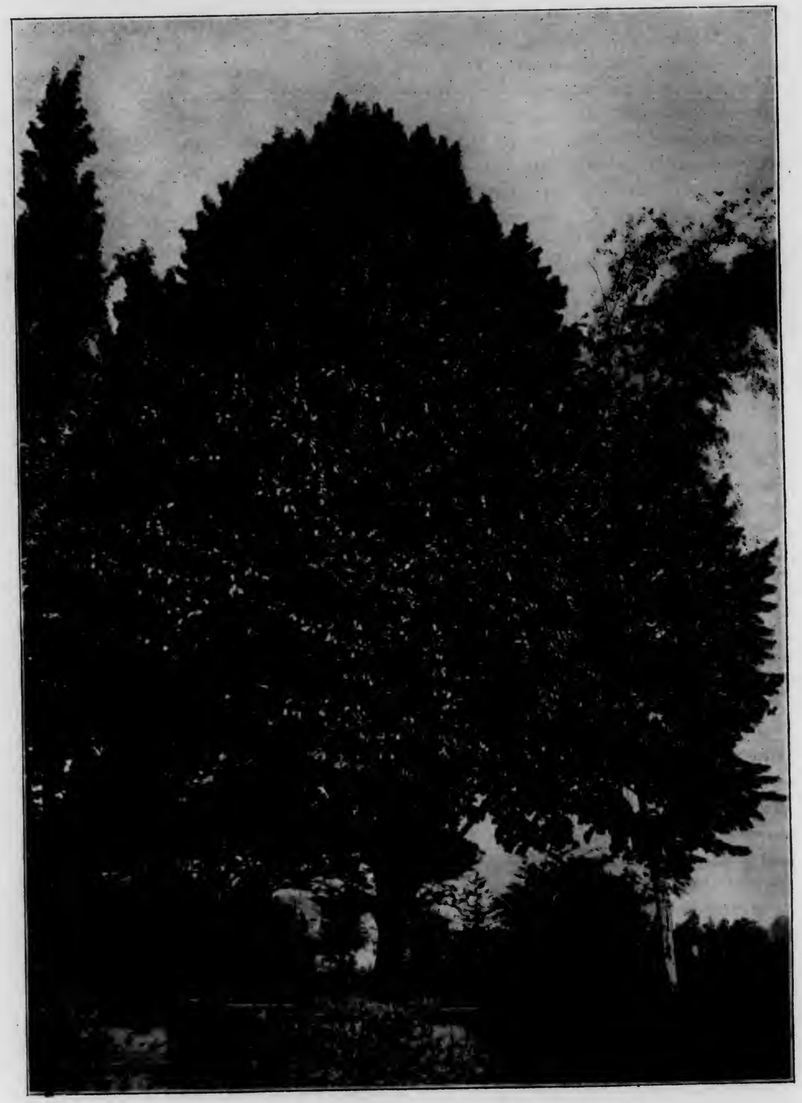
A singular fact was noted and placed on record, by the writer, in the Proceedings of the Academy of Natural Sciences of Philadelphia, some forty years ago, that in all closely allied species of American and European trees, the comparative characters are all in the same line. The close, compact, formal habit, seen in our illustration, as compared with the allied species of America, also characterizes the English Oak, and all trees so related.

Mr. Darwin refers to this paper in his work on the "Domestication of Plants and Animals," and candidly confesses that the facts cannot be accounted for by his hypothesis of natural selection. Our illustration is, therefore, as interesting to the devotee of science, as well as to the lover of beautiful trees.

NEW OR RARE PLANTS.

FONTANESIA PHILLYRÆOIDES.—The *Fontanesia*, a near relative of *Ligustrum*, is an uncommon plant in the United States. It resembles the privet very much and has been so classed by some. But it has not the privet's value as an ornamental shrub. During the past severe winter, about six inches of the growth were killed, in the vicinity of Philadelphia. It has a variety, *Fortunei*. For large collections, it will be found interesting. It is indigenous in Asia Minor. Flowers appear in axillary racemes about August—color, creamy white.

HARDINESS OF ACER MACROPHYLLUM.—It is not generally known that the beautiful Oregon Maple, *Acer macrophyllum*, does well in these parts, (Philadelphia). There are specimens of it in this city twenty feet in height and as many in spread of branches, and since their planting,



WHITE-LEAVED LINDEN.--SEE DESCRIPTION, PAGE 168.

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In the Old World, it is said to be propagated by birds. They eat the sticky berries, and then clean their bills on the branches of trees. The sticky seeds, thus fastened to the branches, sprout and grow.

Seeds sown—as we may say—in this way, are, of course, subjected to the same laws as seeds of those plants that grow in the earth :—that is, there must be the conditions of temperature and moisture that the seed requires for germination. So far as known, these conditions, required by the mistletoe, have not been definitely ascertained. Actual experiment only could decide this.

TREES AND SHRUBS IN CANADA.—Canada seems to be very favorable to the growth of trees and shrubs, for all the supposed severity of its winters. In the catalogue of the Arboretum of the Experimental Farm at Ottawa, of which Dr. William Saunders is Director, 3,071 species, that have been tested, are enumerated, the greater number of which are found to be quite at home there.

THE CAMPHOR TREE.—Mr. W. R. Smith says :—"It may interest you to know that the Camphor Tree (*Laurus Camphora*) is being planted as a street tree in New Orleans. A tree in a four-inch pot, presented to the beautiful niece of Mr. R. Maitre, the distinguished horticulturist of New Orleans, in 1883, is now thirty-five feet high and fifty-two inches in circumference at the butt. From this tree, we receive a liberal supply of seeds each year."

EUROPEAN SILVER LINDEN.—For those who like regularity in growth, few trees are more desirable than the European Silver Linden, a portrait of which, taken from a tree forty years' old, growing in the Meehan nurseries, is given herewith. In the ordinary forms of European Linden, the leaves are green on both sides. In this one, the upper surface is of a deeper green than usual, and bright silvery sheen characterizes the leaf below. It is often called Hungarian Linden, and is even classed as *Tilia alba* in some European works, as if it were a distinct species ; but the seeds from this tree produce as many plants of the common form of European Linden, as of the silvery-characteristic parent. In nurseries, it is propagated by grafting. The one illustrated was grafted on the common American Linden. It will be noted that the American stock, which forms about the lower half of the trunk, has not reached to nearly the girth of the European. Dendrologists may, therefore, safely say, that under equal conditions the European Linden is much more adapted to profitable timber culture than the American, so far as the single item of rapid growth is concerned.

The contrast between the dark and light surfaces of the leaves gives much pleasure to those who delight in ornamental foliage ; while the delightful odoriferous flowers are grateful alike to human beings and the bees.

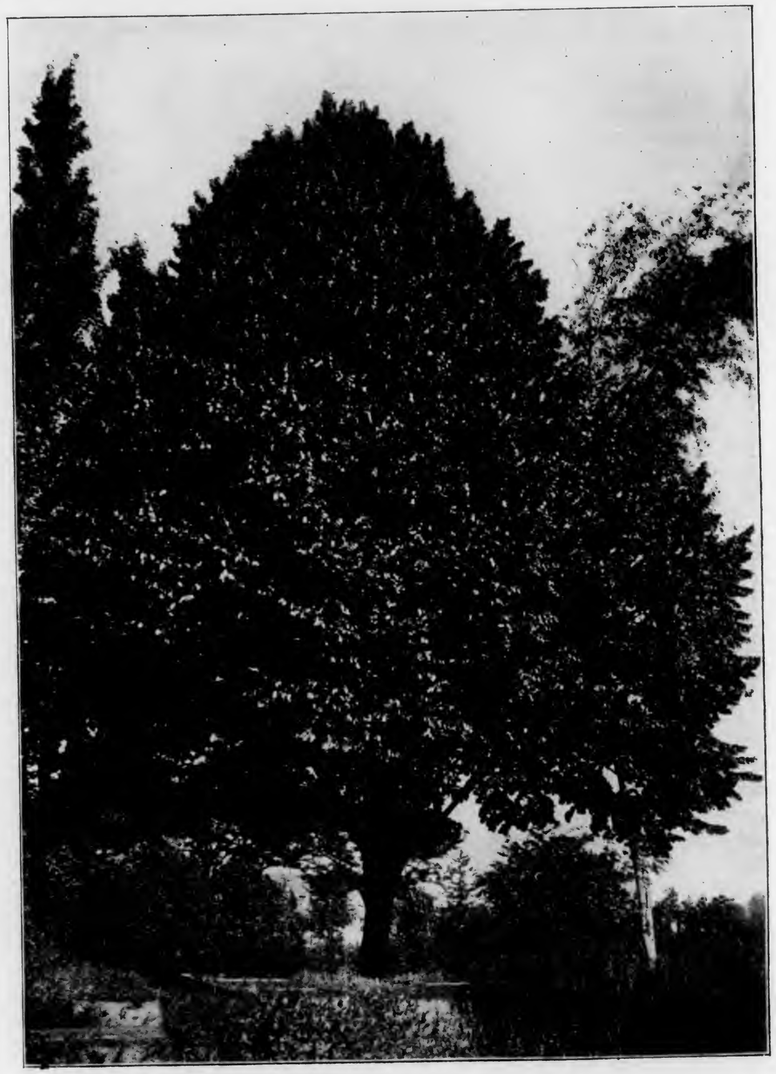
A singular fact was noted and placed on record, by the writer, in the Proceedings of the Academy of Natural Sciences of Philadelphia, some forty years ago, that in all closely allied species of American and European trees, the comparative characters are all in the same line. The close, compact, formal habit, seen in our illustration, as compared with the allied species of America, also characterizes the English Oak, and all trees so related.

Mr. Darwin refers to this paper in his work on the "Domestication of Plants and Animals," and candidly confesses that the facts cannot be accounted for by his hypothesis of natural selection. Our illustration is, therefore, as interesting to the devotee of science, as well as to the lover of beautiful trees.

NEW OR RARE PLANTS.

FONTANESIA PHILLYRÆOIDES.—The *Fontanesia*, a near relative of *Ligustrum*, is an uncommon plant in the United States. It resembles the privet very much and has been so classed by some. But it has not the privet's value as an ornamental shrub. During the past severe winter, about six inches of the growth were killed, in the vicinity of Philadelphia. It has a variety, *Fortunei*. For large collections, it will be found interesting. It is indigenous in Asia Minor. Flowers appear in axillary racemes about August—color, creamy white.

HARDINESS OF ACER MACROPHYLLUM.—It is not generally known that the beautiful Oregon Maple, *Acer macrophyllum*, does well in these parts, (Philadelphia). There are specimens of it in this city twenty feet in height and as many in spread of branches, and since their planting,



WHITE-LEAVED LINDEN.--SEE DESCRIPTION, PAGE 168.

INTENTIONAL SECOND EXPOSURE

some twenty years ago, no winter has injured them. I am told that in their seedling state they feel a hard winter by losing the ends of the shoots, but not after two or three years have passed.

Those familiar with the European Sycamore Maple would recognize a resemblance to it in this species. There is the same red leaf stalk and five prominent divisions of the leaf, and the seeds are in drooping racemes. But a notable difference exists in the underside of the leaf. The European Sycamore Maple has leaves almost silvery on the under side, while those of the *macrophyllum* are of a shining green, much like those of the Norway.

The name *macrophyllum* is well bestowed. An average leaf on a healthy tree is a foot in width; while from the base of the leaf-stalk to the tip of the leaf it is fifteen inches.

Many Oregon trees and shrubs do well here. There comes to mind, as I write, Lawson's Cypress, *Mahonia Aquifolium* and *Castanopsis chrysophylla*. J. M.

Philadelphia.

IMPROVED GERANIUMS.—What are known in gardening as the family of geraniums, really belong to the neighboring genus, *Pelargonium*, and the branch that is popular in gardening represents the *Pelargonium Zonale*, the zoned or "horse-shoe"-leaved, though they usually go under the name of Scarlet or Bedding Geraniums. There are a large number of species in the Cape of Good Hope, of which the Rose Geranium, the Pepper Geranium, and the Apple Geranium are familiar examples. By selection from natural departures, or "Sports," as the gardeners say, or by crossing one sport by another sport, innumerable varieties have been produced during the two hundred years since the original species was introduced from the Cape of Good Hope to English gardens.

Now and then the florists take a good point to aim at, and then we have races, breeds, or sections, as they are familiarly termed. The illustration, given herewith, is of the English round petal'd section. The variety is known as "Hall Caine," and is appreciated for its great size and showy character generally. Mr. C. W. Ward, of the Cottage Gardens, Queens, New York, gives the following account of it: "The Geranium, Hall Caine, belongs to the English round-flowered section. This section is not, as a rule, suitable for bedding out in American climate, but should be used for conservatory decoration alone. We have, on our premises, about thirty varieties of this section covering a wide range of color. In fact, it covers the widest range of color of any section of the single-flowered zonale Pelargonium. Individual florets of this section sometimes measure 2¾ inches to 3 inches in diameter. The trusses are not very large; the habits of the plants are generally dwarf, and the trusses are usually borne on strong foot-stalks held well aloft."

THE HARDY FLOWER GARDEN.

MANURING ROSES.—Plants growing in well-prepared quarters do not require the roots disturbed annually by digging in large quantities of manure amongst them, but judiciously applied top-dressings are of the utmost advantage. Bone manure is applied by taking a little of the surface soil from around the stem, and shaking a handful or two over the roots, and then return the soil. The finest rose growths and blooms I ever produced were secured in this way. Many persons think their roses will degenerate if the whole of the surface near them is not deeply forked or dug, and much natural manure added every spring, but nothing is gained by disturbing the roots very much. Roses properly planted by the beginning of March, rightly pruned and top-dressed, are sure to give their owners satisfaction from the beginning to the end of the flowering season; and after cultivation will be conducted with little or no expense.—*Journal of Horticulture.*

WILD-FLOWER CULTIVATION.—There is very much pleasure to be gained in growing the common wild flowers found near our individual homes. We walk out to the woods in spring and early summer and we find the ground carpeted with *Phlox pilosa*, the rocks green with moss and pines and the air redolent with the perfume of the flowers and the odors from the trees and earth. And we leave them there year after year, because they are so common, and yearn for the flowers which the florist sells because they are so uncommon. I have for several years attempted to make these common flowers uncommon, by growing them in a pit and having them to bloom very much earlier

than they do in their natural times and places. I have a two-sash pit about 18 inches deep. On its three highest sides, I made a shelf with a narrow board in front. On this shelf I have imbedded three-inch flower pots filled with wild pansies with loam around them and black sandy leaf-mold on the top of the loam. Between the pots, near the outer edge, different species of ferns are placed with moss planted on the leaf-mold. The ferns in time will grow and hang down and over the outer side of the shelf, partly hiding it. On the earth bottom, pots of different sizes are placed in which are planted *Phlox* of different colors

NEW GERANIUM, "HALL CAINE."--SEE DESCRIPTION, PAGE 170.

and species, Spring-beauty *Claytonia Virginica*, and several others. On the shelf at its western end are planted *Viola odorata*, both wild and tame; and between is the Maiden-hair Fern, *Adiantum pedatum* and Lip Fern, *Cheilanthes vestita*. The Walking-leaf Fern, *Camptosorus rhizophyllus*, is planted in pots which have two thirds of their depth filled with broken stone, with two inches of sandy leaf-mold, on which this plant is placed so as to have perfect drainage and be more like home to them. Then I have a few pots with summer blooming bulbs—florists' flowers. As the days lengthen, more sun finds its way down amidst these plants and the air becomes warmer and more moisture-laden, and the plants commence to grow. Long before the phlox and wild pansies bloom in their native homes, these plants bloom. Thus I make common plants uncommon, and it is a real pleasure from the taking them up through the winter, and the pleasant walks hunting them, potting them and caring for them, until they unfold their blossoms. And lastly, the pleasure of giving them away to people who love and appreciate them.

Festus, Mo. F. K. STEELE.

RUDBECKIA "GOLDEN GLOW."—Mr. W. C. Egan, Highland Park, Ills., says of *Rudbeckia* "Golden Glow":—Everyone should have it. How it likes moisture!

"The flowers are splendid for cutting—last well and arrange well." It is really difficult to find anyone having plants not pleased with them. They grow and bloom so prodigiously, and can be arranged in masses or shrubbery beds so effectively. As Mr. Egan suggests, they like moisture, yet, aside from an extremely dry location, they will do well anywhere.

FRUITS AND VEGETABLES.

MUSHROOM CULTURE IN GERMANY.—An experiment to transplant to Germany the growing of mushrooms has been made in Wiesbaden, after the method of the Paris catacombs. A large cellar under storage rooms was fitted out for the purpose. The cellar is 500 square metres, and contains three times 400 square metres of surface for beds, as three wooden frames with bed surface have been placed one over the other. The temperature is kept as uniformly as possible at + 15° Réaumur (or 66° Fahr.) during summer and winter. The process of growing, says the *Globe*, is as follows: The prepared horse manure, which has to ferment, is packed into the beds on wood frames in the cellar, then the mushroom spawn is embedded into the horse manure, and is left untouched for three weeks, until the seedlings appear to view. Then a layer of earth is placed over them, and the entire mass is kept damp by watering, and after a fortnight the picking can begin. Through a varying course of procedure the daily picking amounts to about 25 pounds. Whether the quality of these mushrooms come up to the standard of the French, is not yet known.

SELECTION OF GRAPES FOR SMALL ARBORS.—As regards the varieties to plant, much will depend on personal favor; but in such cases the season of ripening should be considered. As a rule, one does not want fruit ripening in quantities at once. Mr. Geo. S. Josselyn, Fredonia, N. Y., a high authority on grapes, suggests and recommends the following groups to give fruit in succession, the order running from early to late:—Campbell's Early, Concord and Niagara, Moore's Early, Delaware and Catawba; Green Mountain, Vergennes and Jefferson.

From most persons' choice, the first selection will be decided the best, including the two old standards and the promising new one, Campbell's Early. This latter has large fruit, said to greatly resemble Black Hamburgs, for which it is frequently mistaken.

THE CHARLTON GRAPE.—From John Charlton & Sons, we have specimens of their new grape. One bunch weighed ten ounces. It has all the appearance of a fair bunch of the well-known and famous foreign grape, the Black Hamburg. As a fine table grape, it ranks with the best of the native varieties so far produced. It is said to be as vigorous a grower as the Concord. It is on these and similar characters that its popularity will have to compete. It certainly promises well.

PROLIFIC ONIONS.—Mr. Timothy Wheeler sends a sample of an onion no bigger than a large pea, which has two smaller ones from its base. An onion is presumably a branch or stem, that has been suppressed it its upward growth, and each ring in the onion is merely the succulent base of leaf-stalk. There will, therefore, be an axillary bud at the base, or should be, though to our senses it is not developed. In this case, through some interference with the normal growth energy, the invisible buds have become visible, and developed to young onions. There is a variety in gardens known as the Potato Onion, that will make a number of good sized onions from one. This character of forming lateral buds is called proliferous.

WADDELL PEACH.—A correspondent at Glen Cove, New York, writes:—

"I was much interested by the note in MEEHANS' MONTHLY, (August number), on the new Peach, 'Waddell,' for I had that day, August 5th, picked fifteen fine fruits from a young tree bought of J. H. Hale, April 30, 1898.

The fruit reminds me of Oldmixon, in shape and color; but these were not so large, of course. The main points are its early bearing, freedom from rot, and excellent flavor. I have a tree of Carman, the same age, which has 14 larger fruit, with a decided rosy side—no sign of rot, the ban of early peaches."

These were fully ripe August 21st, and three of them weighed 19 ounces and measured each, 8¾ inches in circumference.

Compared with Elberta, it is larger, not so pointed and is of a more lively red, flesh creamy white, flavor not quite equal to Elberta. In short, a vigorous grower, bearing fruit that will sell on sight at this season of the year."

CARRIE STRAWBERRY.—Another strawberry candidate for popular favor is the Carrie, which Messrs. J G. Harrison & Sons, large growers of fruit, describe as follows:—

"A seedling of Haverland, which it resembles, but is an improvement on that variety in color and firmness. It has been on trial three seasons and proves satisfactory in every respect. Every fruit grower will appreciate the improved Haverland because it is prolific and reliable, hence it seems safe to recommend the Carrie to their consideration. In a field of strawberries the past season, the Carrie was one of the very best and perhaps the most promising new variety in that collection of probably more than seventy-five varieties. The fruit was of good color, foliage green, and ripening all of its fruit. It seems to hold up well for several days after being picked. We consider it one of the best among the new varieties. Flowers imperfect."

APPLE OPALESCENT.—From the Dayton Star Nurseries, Dayton, Ohio, we have a sample of the Opalescent Apple, a seedling from an old orchard near by. It is rather larger than our best specimens of Baldwin, but resembling it in all other characters, and this is high praise.

SELF-MIXING SPRAYING MACHINES.—A spraying apparatus of comparatively recent introduction is one which has separate compartments for the several ingredients, the mixture being made as the pumping proceeds. Each compartment is drawn upon at one time, the fluids finally mixing in the one pipe, the proportions being regulated by an indicator on the top of the tank. Prof. H. E. Wood, of the Mississippi Agricultural College, and the Deming Co., Salem, Ohio, have been chiefly instrumental in introducing this apparatus.

A SWISS POTATO PIE.—Choose medium-sized, sound potatoes, and after boiling or steaming them in the usual way, allow them to cool; then cut them in slices a quarter-of-an-inch thick, and arrange a single layer of these at the bottom of a well-buttered pie-dish; sprinkle the potatos well with salt, pepper, finely-chopped onion, minced parsley, and grated cheese, then cover with a few tablespoonfuls of thick white sauce, and repeat in this order until the dish is sufficiently full, letting sauce form the last addition, except a sprinkling of grated cheese, which should be added just before putting the pie in the oven; see that the latter is well heated, then, as soon as the pie is thoroughly hot, and colored a nice golden-brown, serve tastefully, the surface being sprinkled with a mixture of finely-chopped parsley and sifted egg-yolk, the pie-dish being placed upon a pretty dish-paper, with a border of parsley-sprigs arranged round about.—*Gardeners' Chronicle.*

BIOGRAPHY AND LITERATURE.

THE GARDEN IN OLD AGE.

O blest retirement, friend to life's decline,
Retreats from care, that never must be mine,
How blest is he who crowns in shades like these
A youth of labor with an age of ease ;
Who quits a world where strong temptations try,
And, since 'tis hard to combat, learns to fly.

—OLIVER GOLDSMITH.

CORNUS FLORIDA,—A NATIONAL FLOWER. - In the various proposals for a national flower, I have not seen the Dogwood—*Cornus florida*—mentioned. Yet, it would be, in several ways, an admirable one.

It is sufficiently well known.

Its range is sufficiently wide, when its kindred forms are included with it. That is to say: *Cornus florida* is indeed a tree of the Atlantic coast only, and seems not to grow north of Massachusetts; but on the Pacific coast it is represented by *Cornus Nuttallii*, which differs appreciably from it in size merely. The space between—unless in the deserts of the Great Basin, or in New Mexico and Arizona—is filled by *Cornus Canadensis*, which also extends all over Northern New England, and though almost an herb, resembles *Cornus florida* wonderfully in the form of its blossoms. The three species might indeed be counted as one flower quite as well as the species of columbine. Their clusters of berries are also alike.

The blossoms, leaves, and clusters of berries, are admirably suited for representation in any sort of decorative design, or in architectural ornament. The only possible objection to them is that the blossom-like bracts might be mistaken by a careless person for a four-petalled wild rose; and this is not a vital objection, and does not apply to the leaves or berries.

ELIZABETH WINTHROP JOHNSON.

West New Brighton, N. Y.

PROFESSOR AMBROSE P. STUART.—Professor Stuart, well known in connection with horticultural and agricultural chemistry, died at his home in Lincoln, Nebraska, on the last week in September, having nearly reached his 80th year. He was born in Sterling, Massachusetts, November 22, 1820, graduated from Brown University, supporting himself by teaching while there, and after taking his degree of Bachelor of Arts, subsequently studying three years at Heidelberg, and commenced his active work as instructor in chemistry in the Lawrence Scientific School. For many years he was one of the brightest contributors to the meetings of the American Association for the Advancement of Science.

EDWARD T. LATHAM. — Among devoted amateur horticulturists who have been among the earnest patrons of gardening, we are sorry to have to record the loss of Mr. Edward T. Latham, of "Llangollen," New Brunswick, New Jersey, whose death occurred on the 16th of September.

THE WANDERINGS OF PLANTS.— How wonderful is the progress of Botany! It started as a mere aid to medicine, and even down to a couple of centuries or so, great botanical works were simply "Herbals," in which the vegetation was considered chiefly from the druggist's standpoint. Now the science is divided into numerous sub-sections, everyone with its devoted band of enthusiastic followers. Botanical geography is become one of the most alluring sections, and that part which deals with the wandering of plants to and fro over the earth, is by no means the least element in the pleasurable study. If every evidence of the white man's presence on the continent should be blotted from the pages of written history, the plants that have accompanied him in his migration would tell the whole story over again.

A very pleasant sketch of our foreign floral settlers, appears in the *Churchman* of September 2nd, from Mr. C. F. Saunders, whose pleasing pen has on several occasions instructed and entertained the readers of MEEHANS' MONTHLY. He points out that all four quarters of the globe are represented, and those who have acquired the language of flowers may fancy they hear the foreign accents of the various nations in every weed they meet. Some, like the dandelion, seem satisfied with every kind of treatment, and "welcome or welcome not" is all the same to them, as he well says. But others are more sensitive. The "wee, modest crimson-tippit" daisy of Burns is seldom seen. Our climate is generally too dry to suit its refined taste. On the moister shores of the Northern Pacific, where atmospheric moisture is as abundant as in Britain, the lovely little flower is almost as common, in the meadows and pastures, as in the green fields of Northern Europe. There is unbounded interest in the study of these things.

FUNGAL FLORA OF THE LEHIGH VALLEY.— By Dr. William Herbst, published by Berkemeyer, Keck & Co., Allentown. Pa. Funguses, in their genera and species, have such a wide distribution, that even a local flora relating to them has a general interest. It will not be a surprise, to those conversant with this order of vegetation, to be told that no less than 152 genera are described in this book of Dr. Herbst. There is one feature of this work especially commendable, that though strictly scientific, and the language of science strictly adhered to, the popular reader would hardly recognize the fact, so clearly and distinctly is everything presented. With this book in hand, even a novice would have little difficulty in working out even the most unfamiliar "toadstool" that might come before him.

The following extract, from the introductory chapter, is a fair specimen of the instructive style.

"Fungi are by far the most numerous of the group; it is easier to tell where they do not grow than where they do grow. To say that fungi are to be found everywhere would not be strictly true; but to say where they are not to be found would be puzzling. Not only are they to be found in the shady woods, mossy dells, secluded lanes, fence corners, etc., but we meet them in all situations where vegetable life is possible. They are both saprophytic and parasitic—saprophytic, growing on dead vegetable and animal matter. We need not travel far from home to find specimens of our research. The unwelcome dry rot beneath our kitchen floors; the different species of mould infesting our preserved fruits; the yeast for raising our bread and brewing our beer; the mother of vinegar for our vinegar; all are due to fungi. From cesspools and sewers the minute dust-like spores rise into our dwellings unseen; they float into the air, producing disease and death. It is strongly proved that diphtheria, consumption, typhoid fever, are nothing more nor less than the ravages of fungi spores."

ALOYS MUELLER.—Some of the ablest and most useful botanists are not the most prominent. Few did more for the amiable science, in New Brunswick, than Aloys Mueller, though to the general public he was known simply as in the florist's business, which he had carried on there for thirty years. He died October 8th, in his 59th year.

ORIGIN OF SPECIES.—Mr. H. G. Shelby, Burlington, Iowa, sends specimens of the common Black Walnut, that mainly on the same tree produces fruit that are practically hickory nuts. It shows, more conclusively than in the case of the Tangerine and Navel oranges, the method by which nature makes species or marked varieties, and will be the subject of a chapter in Mr. Meehan's next series of "Contributions to the Life-histories of Plants."

THE AMATEUR ORCHID CULTIVATORS' GUIDE BOOK.— By H. A. Burberry, with a preface by Dr. J. W. M. Kitchen, New York, Published by G. P. Putnam Sons. This is a new edition of a popular English Book, adapted to American cultivators. Every one loves orchids, but there is a prevailing impression they are hard to cultivate. Certainly, it requires special knowledge; but this knowledge is not hard to acquire. This book covers all any one may want to know,—and with it any amateur will find orchid culture among the pleasantest of floral occupations.

PHYTOPHILIST.—Papers by eminent men abound with newly-coined names, though too often barren of ideas. The learned term for a lover of flowers is that he is a phytophilist.

GENERAL NOTES.

ORNAMENTAL HOTICULTURISTS.—Ladies will add materially to membership in the "Society of American Florists and Ornamental Horticulturists." There will be no place for plain or ugly featured men here.

ARBOR DAY.—Italy has followed America in establishing an Arbor Day. It is to be held in the October month of each year. In the parks, or some other public place, lessons in tree culture will be given children on the occasion.

PEARS IN CANADA. – Canada has been found very favorable to pear culture, as it has long been known to be favorable to apple culture. The great number of pear orchards have, however, reduced prices beyond a profitable point. But it has been found to be quite remunerative to ship to England, and the export trade is lively.

BLACK WALNUT.—Those who have Black Walnut groves, at this time, find there is a profit in forestry. The timber is bringing almost fancy prices.

A FULLER MEANING FOR HORTICULTURAL SOCIETIES.—To be popular and useful, horticultural societies should be not only founded on a broad basis but should maintain a general interest in all subjects that come under that head. In an address before the Germantown Horticultural Society, Mr. Albert Woltemate made some terse remarks on the subject, which might be profitably cultivated by many existing societies of like character.

"We, as a society, in the present management of our affairs, can advance but small claim to our title of Horticultural Society. We might more properly be termed a Floricultural Society. Our efforts in the way of discussions, exhibitions, etc., are almost all directed to the ways and means of cultivating flowers; far more attention should be given to the cultivation of fruits and vegetables (and even broader subjects of general gardening) than at present. I would not have less flowers, by any means; let us have more, if possible, but also have more of those other products of the earth which our title commits us specially to encourage."

NEW PARK FOR ST. PAUL. — It has been found, by experience, that there can be no more popular movement in towns or cities than the extension of public parks. It has become a common saying, in all the larger cities, that, while the mass of the people virtually pay all the taxes indirectly, they get directly little more than the parks and the public schools. It is gratifying to find the movement for these public grounds growing with increased vigor from year to year. The latest addition to the long list comes to our attention from St. Paul, Minnesota. A patch of some 100 acres is to be condemned for park purposes. It fronts on Lake Phalen, whence the city derives much of its water, and will be called Phalen Park. In this, the City Council is performing a double public service, for while providing a place for the health and recreation of the people for all time, by keeping control of the borders of the Lake, they aid in guarding the water source from pollution,—a point all cities that would be in the advance are aiming to secure.

BIRDS-EYE SYCAMORE.—That evil often has attendant blessings, is well illustrated by the Buttonwood or Sycamore disease.

It is well known that this American relative of the Oriental Plane suffers seriously in early summer by a fungus attack that destroys the young shoots, and other buds have to push into new growth to replace the ones destroyed. But the woody bases, of the dead spring-branches, are grown over by the increase in the woody girth, and form small "knots," or "birds-eyes" in the timber. This gives the timber a great value in the preparation of fancy furniture, and the wood brings a high price in the lumber market.

OXYBAPHUS HIRSUTUS.

OXYBAPHUS HIRSUTUS.

HAIRY OXYBAPH.

NATURAL ORDER, NYCTAGINACEÆ

OXYBAPHUS HIRSUTUS, Sweet.—One foot high, very densely pilose, with long, spreading, articulated hairs; leaves lanceolate, the lower short-petioled; involucre pubescent-tomentose; fruit hirsute. Coulter's *Botany of the Rocky Mountain region.* See also Britton and Brown's *Illustrated Flora of the Northern United States, Canada, and the British Possessions*, under the name of *Allionia hirsuta.*

For the early history of this plant, we have to go to that of some of its allies with which it was once associated, especially the pretty Marvel of Peru of the Gardens, *Mirabilis Jalapa*. This is one of the oldest plants of the American continent known to our forefathers, as it was introduced to cultivation four hundred years ago. Clusius, who wrote a history of rare plants, in 1601, refers to it as the *Admirabilis Peruviana*. Linnæus, when he, reconstructed botany, and reduced plant names to two,—the noun and its adjective,—usually managed to employ terms already associated with the plant. Here he had an easy task. Mirabilis was shorter, and just as expressive as *Admirabilis*. An allied species, of the West Indies, *Mirabilis dichotoma*, is known as the "Four-o'clock-flower," from its opening about that time, and this has been transferred to the Marvel of Peru. The plant is known by either term in American gardens.

The tracing of the common names of plants is often as interesting as any other part of their history. The Marvel of Peru is referred to, by another ancient author, as the *Admirabilis Jasmini rosa*, or the Wonderful Rose Jasmine; but this seems to have become wholly obscure. The plants, now known to us as *Oxybaphus*, were originally classed with *Mirabilis*. We have representatives of both sections among our American wild flowers. Occasionally, our plant is described as an *Allionia*, and this is the name adopted by Britton and Brown as above cited. The differences are not very strongly marked, and have different values for classification according to the views of experts in classification. All three have a calyx-like involucre, formed of a single membrane; while others, closely related in the Natural Order *Nyctaginaceæ*, have this involucre divided into separate bracts. Taking this group with a membraneous, single division, *Mirabilis* retains it unchanged to the last; but in *Oxybaphus*, it continues to enlarge until the seeds ripen. Now comparing *Oxybaphus* with *Allionia*, we find, in the former, the tendency is to an arrangement of the parts in fives, while in the latter they are arranged in threes. As we see in our fig. 3, the enlarged involucre is divided into five lobes. There are the rudiments of five stamens, in the flowers, which, in some species, as in the present one, are always perfect, (fig. 4); and there are the rudiments of five flowers, though they do not all perfect—in the specimen here illustrated, only two have reached the seed-bearing stage. In *Allionia*, the involucre is uniformly three-lobed, the flowers are in threes, and the stamens three,—though occasionally, one will abort. Pursh, who was already familiar with the species grouped under the Linnæan name of *Allionia*, found our plant in a collection, in the "Upper Louisiana," made by Captain Bradbury, about the time he was preparing his *Flora Americæ Septentrionalis;* and as the flowers in the specimen were "sub"-three-flowered, it was referred to that genus as *Allionia hirsuta*. There would seem to be as good reason for retaining the genus *Oxybaphus* as distinct from *Allionia*, as in the cases of numerous others that are yet regarded as distinct by those who would drop this one. The peculiar monophyllous involucre of these plants, early attracted the attention of botanists, and Casimer Gomez de Ortiges, who published a work on the new or rare plants in the Royal Garden at Madrid, in

COLOR PLATE

OXYBAPHUS HIRSUTUS.

HAIRY OXYBAPH.

NATURAL ORDER, NYCTAGINACEÆ

OXYBAPHUS HIRSUTUS, Sweet.—One foot high, very densely pilose, with long, spreading, articulated hairs; leaves lanceolate, the lower short-petioled; involucre pubescent-tomentose; fruit hirsute. Coulter's *Botany of the Rocky Mountain region*. See also Britton and Brown's *Illustrated Flora of the Northern United States, Canada, and the British Possessions*, under the name of *Allionia hirsuta*.

For the early history of this plant, we have to go to that of some of its allies with which it was once associated, especially the pretty Marvel of Peru of the Gardens, *Mirabilis Jalapa*. This is one of the oldest plants of the American continent known to our forefathers, as it was introduced to cultivation four hundred years ago. Clusius, who wrote a history of rare plants, in 1601, refers to it as the *Admirabilis Peruviana*. Linnæus, when he, reconstructed botany, and reduced plant names to two,—the noun and its adjective,—usually managed to employ terms already associated with the plant. Here he had an easy task. Mirabilis was shorter, and just as expressive as *Admirabilis*. An allied species, of the West Indies, *Mirabilis dichotoma*, is known as the "Four-o'clock-flower," from its opening about that time, and this has been transferred to the Marvel of Peru. The plant is known by either term in American gardens.

The tracing of the common names of plants is often as interesting as any other part of their history. The Marvel of Peru is referred to, by another ancient author, as the *Admirabilis Jasmini rosa*, or the Wonderful Rose Jasmine; but this seems to have become wholly obscure. The plants, now known to us as *Oxybaphus*, were originally classed with *Mirabilis*. We have representatives of both sections among our American wild flowers. Occasionally, our plant is described as an *Allionia*, and this is the name adopted by Britton and Brown as above cited. The differences are not very strongly marked, and have different values for classification according to the views of experts in classification. All three have a calyx-like involucre, formed of a single membrane; while others, closely related in the Natural Order *Nyctaginaceæ*, have this involucre divided into separate bracts. Taking this group with a membraneous, single division, *Mirabilis* retains it unchanged to the last; but in *Oxybaphus*, it continues to enlarge until the seeds ripen. Now comparing *Oxybaphus* with *Allionia*, we find, in the former, the tendency is to an arrangement of the parts in fives, while in the latter they are arranged in threes. As we see in our fig. 3, the enlarged involucre is divided into five lobes. There are the rudiments of five stamens, in the flowers, which, in some species, as in the present one, are always perfect, (fig. 4); and there are the rudiments of five flowers, though they do not all perfect—in the specimen here illustrated, only two have reached the seed-bearing stage. In *Allionia*, the involucre is uniformly three-lobed, the flowers are in threes, and the stamens three,—though occasionally, one will abort. Pursh, who was already familiar with the species grouped under the Linnæan name of *Allionia*, found our plant in a collection, in the "Upper Louisiana," made by Captain Bradbury, about the time he was preparing his *Flora Americæ Septentrionalis*; and as the flowers in the specimen were "sub"-three-flowered, it was referred to that genus as *Allionia hirsuta*. There would seem to be as good reason for retaining the genus *Oxybaphus* as distinct from *Allionia*, as in the cases of numerous others that are yet regarded as distinct by those who would drop this one. The peculiar monophyllous involucre of these plants, early attracted the attention of botanists, and Casimer Gomez de Ortiges, who published a work on the new or rare plants in the Royal Garden at Madrid, in

COLOR PLATE
INTENTIONAL SECOND EXPOSURE

1797, proposed the name of *Calyxhymenia* for them, from this circumstance. This was shortened, a few years later, to *Calymenia*, by Persoon, but was rendered meaningless by the change.

The whole history of these plants shows the impossibility of establishing an absolutely stable nomenclature. Professor Conway McMillan, and Professor N. Lord Britton, are two of the strongest advocates of the law of priority, which it is thought would surely bring about such a very desirable end; yet we find the former, in his "Higher seed-plants of the Minnesota Valley," issued in 1892, describing our plant as *Mirabilis hirsuta*, while his companion in the campaign, Prof. Britton, gives it to us as *Allionia hirsuta*, only four years later. Possibly the wisdom of Pursh, as expressed in 1814, is applicable to-day, that new names to replace long established ones, however faulty, should be carefully avoided, and only done in special cases by an eminent authority. *Oxybaphus* has a similar meaning to *Calyxhymenia*, referring to the saucer-shaped involucre, and was applied to this section by L'Heritier, in 1806.

The author first collected this interesting plant on the plains, near Denver, in 1873, and in Southern Colorado, in 1883. Its sudden opening, in the afternoon, seemed so peculiar, that plants were brought home from the latter region and planted in the garden for continuous observation. These observations were continued till 1887, when they were published in the "Proceedings of the Academy of Natural Sciences of Philadelphia." On August 5th, of that year, at 4 p. m., the flowers were preparing to open, as evidenced by a glimpse of the pink filaments through the involucre. By 4.30, the stamens and pistil were fully exserted. By 5 p. m., every flower was expanded to perfection. It was a pretty sight to note hundreds of these flowers keeping time with the precision of a regiment of soldiers.

In these flowers, only three of the five embryonic flowers were perfected. What appears to be a central one, opens the first day,—the others follow in due course. The stamens have the filaments curved in the bud, and are first protruded, loop-like. In developing from 4 to 4.30 p. m., they keep to this condition. At 4.30, however, they straighten themselves with surprising suddenness. The five do not become erect simultaneously, but follow each other, occupying five minutes for the whole series. On the 9th of August, they were again under observation to note the time of closing. This was found to be at the approach of daylight.

On the 11th of August, the afternoon observation was repeated. It was a dark and cloudy afternoon. The preliminary signs of opening, as noted before at 4.30, did not appear till 5, indicating that flowers may, like watches, keep bad time occasionally. Only a solitary flower was open at 6; and not till 7.30 p. m., were they in the condition noted previously at 5. Usually, flowers opening at evening are favored in unfolding by a moist atmosphere and comparative absence of light, and this experience was surprising.

The anthers burst and scatter the few large grains of pollen they contain during the sudden straightening of the filaments. The style is of the same length as the filaments; and the receptive stigma receives the pollen in this way. Later in the evening, the flowers are visited by several species of night moths. The flowers seem to be odorless to our senses; but the moths evidently trace the flowers by power of scent more acute than we possess. They grasp the filaments with their feet, and seem to enjoy the repast, as they give several minutes to each flower.

Like most species of plants that owe their leading characteristic to a more than usual abortion or cohesion of parts, the whole plant shows remarkable variations. Nuttall found a form, so very different from the one originally-described, which would be termed the tpye of the species, that he proposed for it the distinctive name-term of *procumbens*. A specimen, collected by Bradbury himself, and now before the author, has the root-leaves broadly ovate, spatulate, and obtuse at the apex. Another specimen, with a label by Fraser, who calls it *Calymenia pilosa*, has the leaves very large and broad,—some three and a half inches long by one and a half wide; and triangularly hastate in outline. A specimen, collected in Wet Mountain Valley, Colorado, in 1873, by Mr. Brandegee, is very stocky, leafy, and remarkable for its dense hairiness. The usual forms are narrow, as represented in our plate.

EXPLANATION OF THE PLATE.—1. Lower portion of a flower stem of a plant originally from Southern Colorado. 2. Branchlet from the upper portion of the panicle. 3. Enlarged involucre with flowers advancing to maturity. 4. The fine exserted stamens, with pistil and clavate stigma.

WILD FLOWERS AND NATURE.

A WINTER SCENE IN ENGLAND.

Soon as the silent shades of night withdrew,
The ruddy morn disclosed at once to view
The face of nature in a rich disguise,
And brighten'd every object to my eyes;
For every shrub, and every blade of grass,
And every pointed thorn seem'd wrought in glass;
In pearls and rubies rich the hawthorns show,
While through the ice the crimson berries glow.
—SOUTHEY.

OXYBAPHUS HIRSUTUS.—Supplementary to what is noted in the main chapter, it may be said that though *Oxybaphus hirsutus* was not known till discovered by Bradbury, and described by Pursh in 1814, it has a remarkably wide range of distribution west of the Mississippi River. Hooker, in his *Flora Boreale Americana*, notes it as being collected far northwardly. He describes it as the *Allionia hirsuta* of Pursh, and says: "Found about Carlton House, on the Saskatchewan, Drummond. Bradbury (from whom there is an authentic specimen in my herbarium), discovered this plant in upper Louisiana. The present inhabits a much more northern station,—the most northerly of any of the genus, of which the species are more frequent south." This was in 1840. Prof. McMillan observes that it is found in the north, from Saskatchewan and Assiniboia to Colorado, Nebraska, Western Texas, Arkansas, Wisconsin, and in the Minnesota Valley throughout, being abundant in prairie districts, and on rocky, dry banks.

INSECTS AND FLOWERS.—Referring to the remarks concerning flowers and insects in the September MEEHANS', it might be possible to add another point to the discussion by suggesting that perhaps insects have another and, to us, totally unknown sense which directs them to their food. In a city I have caught as many as a dozen night-flying moths in a single evening by using one of the same species, newly hatched, for a decoy. These moths are native of the woods and fields rather than of the city, and are seldom seen, even in the country; yet my moth was able at once to rally a dozen to her assistance. This phenomenon is, of course, familiar to all entomologists; but no one, so far as I know, has given a satisfactory explanation of how the one attracts the others. But if an insect, a mile or more away, is able to locate another, is it not possible that it may locate its food by similar means? Might this not more easily explain the flies upon *Pardanthus Chinensis*, which is said to be without odor? It is to be assumed that these flies were not common enough originally in this plant's vicinity to have been attracted by sight alone.
W. N. C.

The point, suggested by W. N. C., is well taken, and in addition it might be added that the carrion flies would not busy themselves so many hours under the impression they were allured by raw meat. It would take but a short time to find their mistake. It fact, the suggestion was not intended to be strictly serious, but presented just as good a reason as numerous others offered to us by eminent authors who treat on the relations between insects and flowers.

YELLOW PASSION-FLOWER.—The well-known Passion-flower has earned for itself the rank of a beautiful flower; but its yellow sister is less important beyond the line of interest because of its connection, the flowers being small and of merely a greenish-yellow. It is found chiefly in the South—Florida; although said to extend northwardly to Pennsylvania and west to Missouri.

PLEASURE IN IRIS AND KENTUCKY FLOWERS.—The true lover of flowers often takes most pleasure in making observations along one particular line of plants, where there are numerous species and closely allied members of the family. A particularly interesting class of plants is that of Irids. The *Iris* may be found in various sections of the United States, in a

few interesting species ; while the European kinds furnish more varied pleasure. In almost every quarter of the globe some species may be found. It comprises about 175 species and innumerable varieties. Groups may be formed according to certain characters. The roots, for instance, are in some cases rhizomatous—creeping ; in others, almost bulbous. The latter require special care and conditions. They have a garden value, outside of mere pleasure in their study, because different kinds give bloom from spring until fall.

One of our Louisville (Ky.) readers has a large collection of *Iris* in which he takes much pride and personal interest. He writes the following regarding some wild species and other flowers :

"We have here *I. versicolor*, differing somewhat from that I saw at Avalon, N. J., in that the leaves of our plant are narrower. I did not see the New Jersey form in bloom. Also, *I. cristata*, in abundance ; but I have never found *I. verna*, and doubt its growing near here.

Near this city is a range of hills known as the "Knobs," which are vestiges of the subcarboniferous formation, the surrounding plain on which the city is built belonging to the Devonian. On these knobs grows a peculiar flora ; Ericas, *Phlox pilosa*, *Lithospermum*, *Liatris*, *Viola pedata*, and other interesting plants found nowhere else in this section.

The most interesting of all, perhaps, is *Viola pedata*, of which there are two forms, the type and var. *bicolor*, Pursh. The two kinds grow in most intimate association, though I have found but one plant that showed clear evidence of crossing. These violets are found on the western slope of these hills growing in a stratum of tenacious yellow clay, not over twenty-five feet in thickness—neither above nor below it, though they do fairly well when transplanted to other situations and sometimes bear seed ; but I have not been able to find any young plants among them on my grounds."

Fondness of Bees for Sumach.—It is often recommended that linden trees be set out that bees may feast from the flowers ; but has it ever been observed by others how uncommonly fond of sumach these insects are ? Let a piece of bark be taken off a *Rhus typhina* in early summer while the sap is active, and at once the whole surface of exposed wood becomes so fully covered with bees that nothing whatever of the scar can be seen. The visits of the insects are kept up until quite late in summer.

I have not observed whether the flowers of this species are visited or not ; but it is a sight to see them on those of the *R. copallina*, which are in display in August, When the heads of flowers are fully open they are so full of bees that hardly is there room for a new comer to alight. J. M.

Large Pine Trees.—British Columbia has many species of large, cone-bearing trees. One of the most interesting of these is the Sugar Pine (*Pinus Lambertiana*), so called because its resin, when half burned by the passage of a fire, is sweet. Ford notes a fallen tree of this species 215 feet in length and 57 feet 9 inches in diameter. The same writer speaks of pines of a certain species growing on the Columbian River that attain the height of 240 feet.

In running the boundary between British Columbia and the United States, the axe-men had, in one locality, the herculean task of hewing out the line through patches of gigantic Douglas Spruce, many of which were 30 feet in circumference and from 200 to 250 feet in height.—*Canadian Horticulturist.*

Trees Encircling Foreign Substances.—I became acquainted with a man who, some years ago, in working up a wood-pile, found one block (of clear wood, free to split) which he could not split. He chopped into it to see what the trouble was, when, to his astonishment, he found a trace chain encircling the inner part. The same man found, in another tree, an iron bar. T. Wheeler.

Moscow, Vt.

Autumn in the Mountains of North Carolina.—A correspondent writing from Blowing Rock, North Carolina, in the early part of October, says :—" I have never seen so glorious a fall—we had a wet spell followed by sharp cold, and every tree took on some shade of red, yellow, or bronze,—the maples adopting all."

Since the manner in which nature operates in coloring leaves and flowers has been made plain, the study of her works, in connection with the glory of American autumn scenery, has a new interest.

GENERAL GARDENING.

THE GARDEN IN WINTER.

My very heart faints, and my whole soul grieves
At the moist, rich smell of the rotting leaves,
And the breath
Of the fading edges of Box beneath,
And the year's last Rose. —Tennyson.

New Wood Over Wounds.—I notice, with interest, "Cloverly's" note, "Dead Patches on Tree Bark." I would like to say, in such cases, and in cases where trees have been wounded by careless lawn-mowing, I have found that the "patches" will cover over much sooner if one takes a sharp knife, while the tree is making its soft-wood growth in spring, and draw the edge of the knife along the line of the patch, cutting into the new growth. The elaborated sap seems to ooze out and a surprising amount of new wood is the result. This operation may be necessary two or three years in succession, according to the size of the patch ; but the result will be a complete union of the new wood over the patch.

Morris Plains, N. J. E. Reagan.

Yellow Tree Lupine.—The yellow Lupine of California, *Lupinus arboreus*, is one of the grandest of ornamental plants, when it finds itself in localities suited to its tastes. *Gardening Illustrated* refers to a specimen in an English garden that is already a grand bush eight feet high. The hundreds of spikes of brilliant yellow flowers must be "a sight to see," as the expression goes.

Top-dressing Lawns.—Much valuable fertilizing material is wasted where applied on frozen ground that is sloping. The rains and melting snow carry it off. Stable manure affords protection to the surface roots of grass, and is in that way beneficial, even though the fertilizing constituents are largely lost.

Considering the matter solely in its relation to fertilization, unleached wood-ashes are largely taking the place of manure, as they are less offensive, unsightly, and do not make possible the spreading of weed seeds. To get the most benefit from ashes or any other fertilizer, they should be applied about the time the roots may be expected to use them, or when the soil will readily accept them. Therefore, apply ashes before the ground freezes, that they may work into the soil ; or in early spring, in time for the roots to make use of them.

Arbor-vitæ and Salt Water.—The question of what evergreens will thrive along the sea-coast frequently arises, a direct answer being impossible. A correspondent writes :—

"Can you give me any information as to the arbor-vitæ's sensibility to salt ? We wish to plant a hedge where the salt or brackish water will be within four feet of the surface."

The conductors have seen a very general assortment of evergreens growing well along the coast—retinisporas, firs, junipers, etc., but none were so close to the water as four feet. The juniper seems to thrive admirably, and in smaller sizes looks well. Among broad-leaved evergreens, the Japanese Euonymus is an acknowledged leader at the sea-shore. Japanese or Californian Privet, though not entirely evergreen, is nearly so, and has been seen as close to the water as our correspondent describes. The Chinese Arbor-vitæ is a very sturdy evergreen, and ought to stand a great deal.

The English Yew.—The famous English Yew does admirably well in the Middle States, and would probably succeed in the far north when planted so as to be secure from cutting winds in the winter season. One of the oldest trees in America grew in Germantown, Philadelphia, up to a few years ago, when it was destroyed in the march of building improvements. It was almost as large as the two-and-a-half-story building adjoining, and the trunk was many feet in circumference near the ground. An illustration of this tree is given herewith. The Germantown Horticultural

Society initiated measures looking to the purchase of the corner lot, so as to preserve the tree. The public feeling for its preservation was so strong that this part of the programme promised success. But the care of the tree for all time, subsequently, was a problem that could not be solved, and the grand old yew had to be left to its fate.

SURFACE WATER AND SPRINGS.—Please accept my thanks for the publication of your truthful contention, that the roots of trees take up a great amount of water and make the soil under them dry. The same is true of all growing land plants. I suppose trees with needle-shaped leaves take up much less water than trees with broad leaves, and that the faster a tree grows the more water it takes from the ground. I think the ground upon which a thrifty forest is growing (in June, July and August), will be drier than it would be were it nude. So you and I think alike upon the above points. Do not deciduous trees, when forming their leaves in the spring, use more water than in midsummer? Do not trees during summer droughts use much less water than when the ground is moist? Provided the rainfall is the same, will not more water be used up by the plant growth in a highly cultivated river valley than there would be if the valley produced less plant growth? If the entire valley of the Mississippi yearly produced double its present annual amount of plant growth, would the river discharge its present amount of water? I think increased crops may diminish streams, unless they increased the rainfall, and I think the atmosphere is so vast, and moves so rapidly, that it would require a great increase of plant growth in a vast valley to increase the rainfall perceptibly. Our White Mountain region, which is one source of the Merrimac River, was chiefly covered with forests. Millions of dollars were invested in manufacturing establishments upon this river. No investor in these establishments said a word about having the White Mountain forests preserved. Some thirty-three years ago, the Governor proposed the selling of the White Mountain lands, and they were sold at a very nominal sum without a word of protest from the mill-owners. The purchasers found means to utilize the lumber,

THE OLD YEW TREE IN GERMANTOWN.

and after they had been lumbering several years, not the *mill-owners*, but certain theorists, began to preach that the cutting of the White Mountain forests would ruin, or at least greatly damage, the Merrimac as a water-power for manufacturing purposes.

Three points were urged by these theorists: (1) That it would diminish the rainfall; (2) that it would cause higher freshets; (3) that it would cause the river to be lower during dry weather. Perhaps they have generally given up the first,—the second and third they still contend for, and urge that the State prohibit the purchasers from felling most of the trees which the State sold to the purchasers; and another of their propositions is for the State to take possession of the land which it sold a few years ago.

The æsthetics protest against the lumbermen without stopping to think that the forests are kept more thrifty, and consequently more beautiful, as well as more profitable, by removing the full-grown trees so that the young ones may grow. Of course, the lumbermen, cutting all the trees, injure the scenery for quite a number of years, and this is especially so when fire follows the axmen, as it too often does.

If the water that falls in the valley of the Mississippi could be furnished to each and every acre of the valley, to the extent required in order to make it yield the greatest amount of farm and forest crops, would there be much left to run off in the river? Would not the valley, then, cultivated as well as some market gardens are cultivated, supply the world with food? Malthus may have had a great amount of University learning and culture, but he knows little of the possibilities of scientific agriculture. J. D. LYMAN.

Exeter, New Hampshire.

The senior conductor of MEEHANS' MONTHLY has been preaching the doctrine presented by our correspondent for nearly half a century. But so few understand the geological conditions as affecting underground water courses, that sound deductions make little progress against sentimentalism. Local rainfall has little to do with springs. The great rivers of the world owe their chief volume to the rains and melting snows of high mountain ranges, that fall above the timber line. Following the incline of the rock, the water flows, often hundreds of miles, through the rifts in the strata, before it finds an outlet at the earth's surface. Even though there should be extraordinary falls of rain more than the surface earth could retain for the use of vegetation, only in rare instances could this surface water get through the underlying rock so as to reach the streams below. Here and there clefts might be found for percolation; but it could have no appreciable influence on the great volume below.

FEEDING ROOTS OF TREES.—Referring to your answer to my questions in my article of "Planting Trees too Deep," it brings up several more questions, one of which is: How does anyone know that there are no fibrous roots belonging to the subsoil roots? Fibrous roots, as I understand them, are feeding roots. You say that "fibres are not produced from the main roots deep in the ground, because there is no food for them to work on." Now, we say, regarding the clover roots, that they send down their feeding roots, deep down into the ground, and bring up the food which is stored there. This is what is said of the Alfalfa, also. To let a little light in on this question, we must remember the fact, which all of us know, but we all do not think about it as we go along, that forest trees, as well as other trees, draw the most of their sustaining food from the depths of the earth, and there must be fibrous roots as deep down into the ground as they can go. If they cannot find food down there, they would perish, for, in the dense woods the surface roots have to compete with the surface roots of all other trees in their vicinity; but, down below is an unexplored country, and the riches have been sinking down for centuries. These roots follow down as deep as the tree is tall.

Can anyone controvert this claim of mine? I have seen the roots of a willow tree at the bottom of a fifty-five-feet well, and the tree, itself, was not forty feet tall. I have examined the forest trees on the edge of a caving-in bank,—river bank,—and have traced the long, slim roots, at its foot, forty or fifty feet below.

You say, in planting, the "holes should be made deep and filled with porous material, to form reservoirs of air and moisture." Such, for example, as straw or coarse manure, or

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brick-bats or rock, then the trees to be planted on top, I suppose, in clean earth well rammed. I think, with you, that the reservoir plan is a good one, and the next trees I have to plant I will try it. I suppose old tin cans would answer as well as straw, for I can get several wagon-loads quite handy. I wonder if we cannot get that idea patented?

Festus, Missouri. F. K. STEELE.

Mr. Steele touches on a theoretical question of immense practical importance. To appreciate it properly, one must follow facts carefully. For instance: When a large tree, growing in an undisturbed position for many years, is examined, the earth, at and just below the surface, is found a mass of dead, thread-like fibres, resembling sponge, through which living ones may be seen working their way. These living ones seem to start into growth soon after midsummer, and before next midsummer are mostly dead,—the stronger surviving to become permanent roots. These are known as the feeding fibres or rootlets, as they undoubtedly are. When we get a chance to see a section of the earth below the trunk of a similar tree,—as we often can in a railway or similar cut through a forest,—we note that this class of rootlets practically disappear in proportion to the depth from the surface. The roots found deep beneath the surface,—and which are sometimes found at long distances, as noted by Mr. Steele,—bear so small a proportion to those near the surface, that for all practical purposes we say the feeding roots do not extend far underground.

It would probably be extravagant to say that the few roots deep beneath the surface aided, in no respect whatever, in furnishing food to the tree. A rootlet, that may be one in a thousand to secure a permanent lease of life, should surely be able to carry with it a power as a food preparer, possessed by its less fortunate annual brother.

Beyond all this, it is a well-known fact that, if the surface under a tree be filled in several feet with compact earth, the tree dies; but if a layer, a foot deep, of "tin cans" were placed over the surface before the filling in, the tree trunk might be filled in twenty feet deep without injury.

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BROWALLIA SPECIOSA MAJOR.--SEE DESCRIPTION, PAGE 185.

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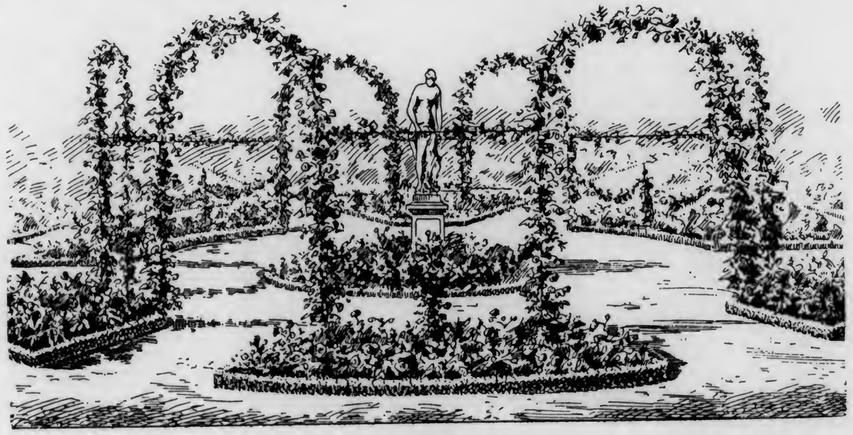

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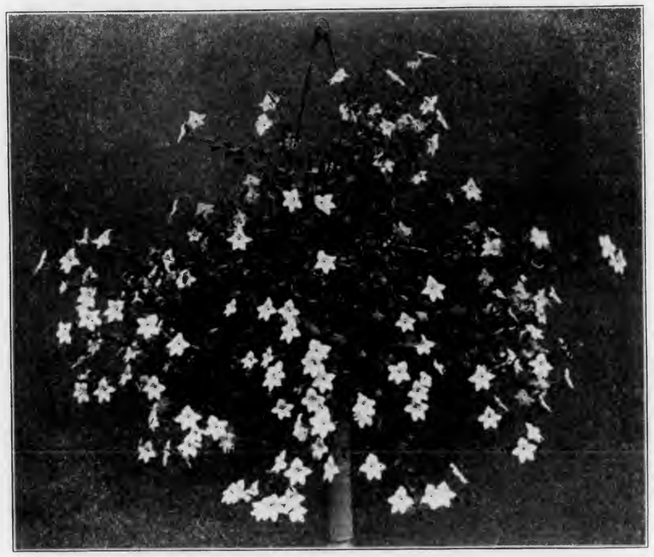

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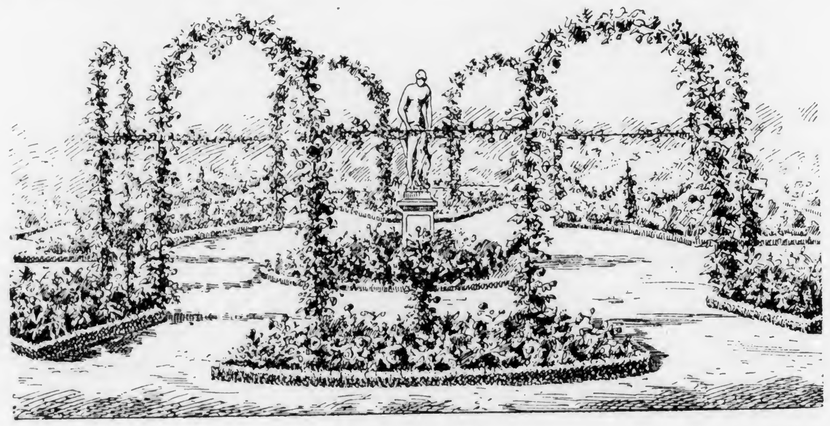
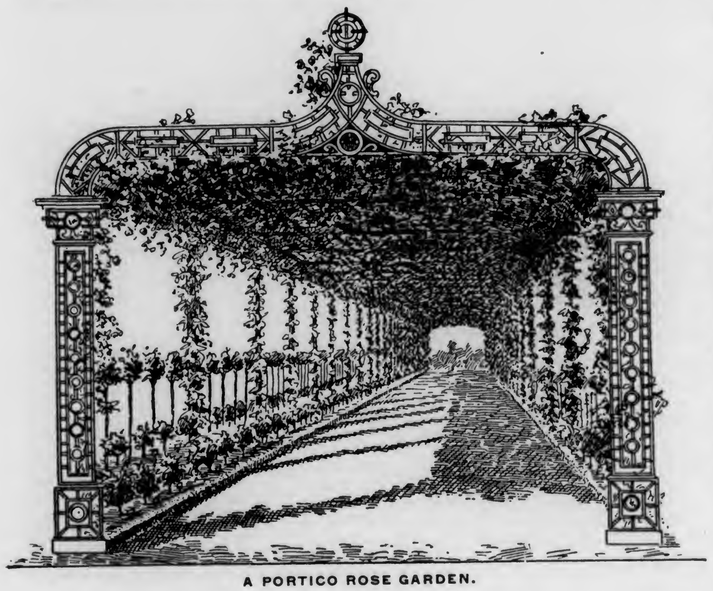


AN ARCHED ROSE GARDEN.

INTENTIONAL SECOND EXPOSURE

by a lawn-mower, and trees and shrubs scattered around, as if one had thrown a handful of stones, and set in a plant on the spots where the stones fell. Intelligent people are already tiring of this, and on all sides come cries for "our grandmothers' gardens," with their neatly-trimmed box-edgings around little plots in which real flowers grew.

These remarks are inspired just now by reading, in the *Revue Horticole*, an account of a French gentleman, named Hay, who has a wonderful garden in which the rose plays the leading part. Not only all the varieties that are popular with florists are gathered together here, but every species that may have been described by botanists finds a home on the grounds. They are not scattered pell-mell, in "natural style," in every direction; but are gathered together in the most artistic way, and in many ways. Two of these are transferred from our French contemporary. One presents a view of the "Garland Garden," the other the "Portico Walk."



A PORTICO ROSE GARDEN.

What is being done here with roses, can be applied to numerous other classes of plants. Ornamental flowering vines, suited to American gardening, are numerous,—but American gardening to-day derives little advantage from them. By a due introduction of frames, artistically arranged as this Frenchman has arranged his rose frames, pleasure and delight would be brought in numerous ways, of which garden lovers to-day are wholly deprived.

No one would desire a return to these old styles to the exclusion of natural beauty. We would not ask, as a verdant son of the Emerald Isle is reported to have asked, that if a few quinces made a pear pie taste so good, how delicious would it not be if the pear pie were made wholly of quinces? But there can be no question that a judicious mixture of both styles would be no disadvantage to good gardening?

ROSE-PRUNING.—This needful operation will now, of course, be much in the mind of the grower, and it is astonishing, considering all that has been written on this subject, and the number of questions that have been asked and answered, that so much ignorance should still prevail on the subject. An amateur would never entrust this operation to the gardener unless he is one whom he has specially trained for it, and upon whose carefulness and intelligence he may thoroughly rely; for a man may understand all about vines, stove plants, etc., yet put him into a rose-garden, it is certain that he will make a muddle of it. He has learned that hard-pruning is necessary, and so he treats all alike, whether they are strong or weak growers; whereas an amateur usually knows that the hard-pruning applies to the weaker growers, and if he applies it to the stronger ones, he will get plenty of shoots, but few flowers. After such a season as we have just gone through, where in this south-eastern part of England we have had neither frost nor snow of any consequence, the grower may be tempted, when he sees the extremities of his rose-shoots covered with foliage, to think it is time for him to apply the knife; he will be unquestionably wrong if he does so, because I do not think anything should be done to encourage a too early start of the buds towards the base of the shoot, on which he will rely for his blooms in the coming season. If the shoots are left long, there may be growth at the extremity which will absorb the sap, and so prevent the lower buds from swelling.—*Gardeners' Chronicle.*

SANTOLINA INCANA.—I see in a catalogue a perennial plant named *Santolina incana*. Will you not, some time, give us a picture of it, if possible, in your magazine, to make it better known to the people?

One German author of Egyptian stories, Herr Georg Ebers, tells of a little *Beytharan* plant, so-called in Egypt, which grows in the desert. He says about it:—

'How often in the desert I have seen
The small herb, *Beytharan*, in modest green,
In every tiny leaf and gland and hair,
Sweet perfume is distilled which scents the air.
How is it, that in barren, sandy ground,
This little plant so sweet a gift has found,
And that in me in this vast and desert plain
The sleeping gift of song awakes again?"

This rare little plant is catalogued by Haage & Schmidt, in Erfurt, Saxony, as *Santolina fragrantissima*, or *Heiligenpflanze* (plant of the Saints). It is a succulent, and finely adapted for edging. This corresponds with your description of the same plant, and consequently my calling attention to it.

Hartford, Conn. MRS. W. SELIGER.

The *Santolina incana* is a very dwarf, grayish bush, and distinct from the very interesting plant now being introduced by Haage & Schmidt. Indeed, the latter is not regarded by modern botanists as a *Santolina* at all, but one of the milfoils, and is quoted by recent authorities as *Achillea fragrantissima*.

JAPANESE ANEMONE, "QUEEN CHARLOTTE."—At the recent annual Exhibition of Plants and Chrysanthemum Show, of the Pennsylvania Horticultural Society, in Philadelphia, Mr. Henry A. Dreer exhibited a new Japanese Anemone, variety "Queen Charlotte." It bids fair to become a very popular variety, on account of the size and coloring of the flowers.

FRUITS AND VEGETABLES.

FOOD BY INJECTION.—Your correspondent was so fortunate, the present season, as to have raised a mammoth pumpkin which was exhibited at the October meeting of the Germantown Horticultural Society. It measured five feet two inches in circumference, and weighed 80 pounds.

One of the members of the society enquired what treatment the vine had received that might account for so unusual a growth of its fruit; whether any stimulant had been applied to that end, adding that "up the country," amongst the farmers, when mammoth pumpkins were desired, milk was poured down the hollow stem of the vine, it having been cut off a short distance beyond the fruit, and that he had known a pint of milk at a time to be fed in this way, daily. In repeating this, an incredulous critic maintained that the growth could surely not thus be stimulated, for nutrition could only be applied through the root, that being the stomach or digestive organ of vegetation; and since the milk, probably, did not reach the root and return to the fruit, the growth of the latter would not thereby be increased. The writer was not sufficiently acquainted with the biology of the vegetation to decide this question; but the case of the Fly-trap occurred to him as an analogous instance, for surely the fly, or the morsel of beef, as it may happen, cannot be first carried to the root before it nourishes the flower or plant. Will the editor of the MONTHLY furnish his readers with his views on this subject? W.

We agree with our correspondent that the milk could scarcely aid,—but that it is not impossible. Matters of this kind are so easily tested by experiment, that opinions seem of little value.

ORIGIN OF SMITH'S CIDER APPLE.—One of the famous apples of the vicinity of Philadelphia, is Smith's Cider; but, though in a general way it is ascribed to "Bucks County," its real origin is not known. The following extract from a letter placed in our hands by a Philadelphia friend, carries its history back to a remote period, at any rate, and may bring out other facts. The apple sent has all the general characters of Smith's Cider, as grown here; the only differences being that it is

brighter and better looking, ripening earlier, and with a more mellow and sweeter flesh. But the southern locality may explain this :—

"Baltimore, Md., September 22, 1899. As you are aware, in 1776, a number of Friends were banished from Philadelphia to Winchester, Va., among them I mention James Pemberton, Henry Drinker, Thomas Wharton, John Hunt, William Smith, Samuel Fisher, Miens Fisher and others. After they reached Winchester the Friends of the neighborhoods took them in their families. Among the latter was Isaac Brown, great grandfather of the writer. While they were with him, they planted an apple orchard, sending to Philadelphia for the trees. The farm on which they planted the trees came from my great-grandfather. The trees have been bearing apples for one hundred and twenty years, and annually my two cousins, maiden ladies, Eliza and Kate Brown send me a few apples as a remembrance of our childhood, seventy years ago.

The farm has never changed ownership.

Thinking that you may know some of the descendants of the Friends, I send you an apple known as the Smith Apple, which is supposed to be named after one of the Friends. I have never seen the apples out of the neighborhood of Winchester. They may be interested in seeing an apple from a tree their ancestors planted a hundred and twenty-three years ago."

It may be added that the word "cider" is a later addition, and misnomer, as it is about the least fitted of any apple for cider-making.

COFFEE-RAISING IN FLORIDA.—An article in one of our contemporaries, calling attention to the first production of coffee in the United States, (in Porto Rico and Hawaii), brings to the writer's remembrance a pleasant experience when in Southern Florida about eleven years ago.

Along the south-eastern coast of Florida, there is a long and narrow strip of land between Lake Worth and the Atlantic Ocean, one of the principal sections of which is known as Palm Beach. It is a delightful spot to one unaccustomed to real tropical scenes. Here may be seen large, graceful cocoanut trees, their branches somewhat resembling our pretty little house palm, *Cocos*, only on a magnificent, large scale. Some of our readers may recall an illustration in MEEHANS' MONTHLY some years ago from a photograph taken at that time. Besides being planted in groves, where the cocoanuts, huge in their husks, hang thickly on the trees in all stages of growth, they line avenues, or walks, the graceful fronds arching overhead.

But, concerning the coffee, it was in a private garden, where visitors were made welcome, coffee plants were seen growing nicely and producing the seeds—or simply coffee, as we usually speak of it. Two are encased in one thin husk, the flat sides together. The owner of this property, a northern man, took considerable pride in his southern garden, and especially in testing various commercial plants, like the coffee, not seen outside of more tropical climates.

Visitors to Florida should not fail to go to this section, where there is so much of interest unlike anything else in the South.

STRAWBERRIES UNDER GLASS.—The London *Journal of Horticulture* notes that growing strawberries under glass for marketing is taking on large proportions. They are grown in pots, and in houses in which other things follow in succession. Strawberries occupy the space from a little before Christmas to the middle of June,—tomatoes or cucumbers take their place up to the middle of October,—chrysanthemums follow to Christmas. One grower has mushrooms for a connecting crop, the mushrooms coming up in the spaces between the flower pots. Another grower has 40,000 plants under glass, and commenced marketing the fruit in early April. There was about a quarter of a pound to each pot. They simply come on in a sort of natural way under glass. Real forcing has not been found profitable.

It is said that a great drawback to this culture is the cost of marketing. Each grower seems to paddle his own canoe in this matter. If the business were large enough and steady enough to warrant a community of interest in a distribution plan, the profits would be enormous.

FRUITS AND VEGETABLES AMONG THE SHAKERS.—It is said that the remarkable longevity of the Shakers is claimed by them to be due entirely to the self-enforced rule of regular sleeping hours and meals, the kind of clothing worn, the manual occupation and the food partaken of at the settlement. The most of the Shakers are enthusiastic vegetarians. Contrary to the opinion of many food authorities, they consider tomatoes as exceptionally healthful. They use them for breakfast, dinner and supper all through the tomato season, while the Lebanon Shakers put up about 400 gallons for their own use every winter. As these Shakers have not had a case of fever in the family for thirty years, have almost no other sickness, and scarcely ever a doctor, it looks as though their diet agreed with them. Another vegetable that they especially prize is celery, which they think good for the nerves. Apples in abundance are also a staple article of diet, served baked, in a warm sauce or even in pies and puddings.

HYBRID SAND PEARS.—Since the Kieffer Pear appeared,—a supposed hybrid between the Sand Pear and the Bartlett,—the list of good kinds of this class has increased. Besides this, there is now the Le Conte, Garber, and Cincinnis.

LIVINGSTON TOMATO.—Livingston Co., Columbus, Ohio, are introducing the Livingston Tomato, claimed an advance in good qualities ; five inches across and very smooth.

THE FIG TREE.—The fig is one of the few fruits that seem, in a measure, disease-proof. For ages it has held its own as the great friend of man. Excellent crops were raised from winter-protected trees in the open ground, near Philadelphia, last year.

FRUIT EATING ANIMALS.—The sweet and luscious grapes are eaten with great relish by horses, cows and sheep. Deer are fond of grapes, and often do much damage in California vineyards. Hogs fatten upon grapes, rabbits love them, and a number of the wild animals, as the elephant and camel, will eat them.

The apple ranks high in favor, and horses, cows, sheep, goats, hogs, and many of the wild animals eat apples with avidity. The elephant and deer are fond of them, while others become accustomed to them after a trial or two. All the domestic fowls and many of the wild birds are fond of apples.

The fig is the favorite fruit among animals, and camels, horses, cows, hogs, sheep and goats, will eat this fruit as readily as man. The elephant considers it a dainty, while all the fowls greedily devour figs.

The esquimaux dog will eat almost any of the dried fruits. The sour or acid fruits, as the orange, lemon, lime, shaddock. etc., as well as sour plums, and the bitter olives, are rarely eaten.

Nothing, perhaps, is so bitter as olives freshly picked, yet after they turn purple and black, hogs soon learn to devour them.

Peaches are not a favorite except with a few animals, though rabbits fancy them.

The cherry is a delicacy much sought after by the whole feathered tribe, (and by boys who are not feathered.)

It is well known that rabbits, rats and squirrels all eat apples.

The ostrich will consume half a dozen kinds of fruit.—*Waverly Magazine.*

FIRST-CLASS FRUITS AND VEGETABLES.—Ignorant writers are fond of ridiculing the culture of fruits and vegetables under glass, as if the sole object were to get something out of season. They do not know that the skillful gardener can beat nature every time in quality as well as in the time when the article may be said to be in season. We have come to learn that, to some extent, in the house culture of tomatoes, cucumbers, lettuce, and some other things,—and those acquainted with the results, understand full well that mere out-door culture could never have product of equal quality,—the prices obtained, by those who grow for market, compensate for all the extra trouble involved. Grape culture under glass was once very popular in America ; but the easy production of the foreign grape in the open air of California, dampened the ardor of our cultivators. But no one has ever yet found a bunch of California grapes to equal the results of a first-class grape-grower of the article under glass. Even in Germany and France, where the grape does well in the open air, the glass house grape-grower finds a good profit in his occupation, if he is a real gardener and not an empiric. *La Semaine Horticole* notes that a cultivator of this class, near Brussels, produced a bunch that weighed over seven pounds. It was sold at auction and brought about $5.50, which we suppose is about the highest price ever paid for a single bunch of grapes.

BIOGRAPHY AND LITERATURE.

NATURE'S TRANQUILITY.

Ah, fading joy ; how quickly thou art past !
Yet we thy ruin haste.
As if the cares of human life were few,
We seek out new ;
And follow fate, which would too fast pursue.
See, how on every bough the birds express,
In their sweet notes, their happiness.
They all enjoy, and nothing spare ;
But on their mother Nature lay their care ;
Why then should man, the lord of all below,
Such troubles choose to know,
As none of all his subjects undergo ?
Hark, hark, the waters fall, fall, fall,
And with a murmuring sound
Dash, dash upon the ground,
To gentle slumber's call.

—JOHN DRYDEN.

JAMES A. ROOT.—Mr. James A. Root, the well-known nurseryman and seed-dealer of Skaneateles, New York, died early in October, from a stroke of apoplexy. The nursery, of some twenty-seven acres, and the beautiful home in the midst, will eventually have to pass into other hands, their only son, who would have continued the business, having passed away before the father. For the present, the widow will continue the business.

CORN AS A NATIONAL FLOWER.—Every season, when the wayside is ablaze with the glory of the Golden-rod, interspersed with its complement of color in the purples of the aster, we have renewed the discussion : what shall be our national flower ?

All honor to the Golden-rod, the "yellow top" of our grandmothers, used so successfully by them in dyeing. We welcome its blossoming time ; but a national flower has demands that our golden favorite cannot satisfy. It is, indeed, a free bloomer in many sections ; but so is tobacco, if we must have a "weed," and the latter is certainly more typical. A flower chosen as the flower *par excellence* of a great nation, should be emblematical in the best sense. What so fully answers all requirements as the maize, or Indian corn, beautiful from its beginning, with its tiny blades to the "full corn in the ear ?" There is an air of grace and grandeur in a field of growing corn, from the waving tassel to the silken ear. With what diversity of coloring it readily lends itself to art decoration, and has wonderful possibilities in a conventional way !

Then, from the practical side, as a food product and its uses in the arts and sciences, it is marvelous. The Indians, from whom came to us this wonderful flower, plant and grain, fully appreciated its value, honoring its harvest time with the great corn-dance.

Then it has both a historical and a political interest, while the very name, maize (bread), is emblematical. What more appropriate motto for a nation founded on truth and righteousness than "We feed the world ?" We love the Columbine of the springtime and the Golden-rod that gladdens the time of the falling of the leaf ; but all simple wayside flowers must twine their bright blossoms for the coronation day, and proclaim corn as King !

SARAH BALLANTINE BOWERMAN.

FORESTRY.—"A Primer of Forestry" is the title of a neatly bound and profusely illustrated book, issued by the United States Department of Agriculture, and prepared by Gifford Pinchot, forester to the Department. It is Part the 1st, of which a second is to follow. The present part deals with the units that compose the forest, with its character as an organic whole, and with its enemies. Part the 2nd, is to deal with Practical Forestry.

HISTORIC TREES AND GARDENS OF PHILADELPHIA.—Philadelphia has been the home of many famous old gardens, the histories of which abound in interesting facts and legends. Where now brick and mortar are dominant, and the bustle of business life out-crowds all thoughts of the different conditions that were, once could be seen large mansions and, then spacious, grounds. Old inhabitants are yet to be found to tell of the farms situated within a few blocks of what is now one of the busiest trade thoroughfares. With the solid blocks of houses extending for miles in many directions, it is not strange that the younger generation finds it difficult to take in the situation portrayed and handed down from one generation to another.

One of the most interesting works recounting the state of things from the time of the early settlers of Philadelphia to comparatively modern times, is "Watson's Annals," a rare old book in two volumes. The following paragraphs were compounded from a hasty glance through its pages, and are reproduced because of the interesting reference to the introduction of the Lombardy Poplar ; and to the similar feeling of the present day against certain legislation affecting trees, and to the enclosing of grounds by means of tall fences or walls. Interesting notes might also have been made of the description of Norris' Gardens, where unusually large catalpas were a prominent feature and the "Yellow Willow" was introduced.

"The chief trees seen in the streets of the city, before the Revolution, were buttonwoods and willows ; several were used by the British for fuel. Such as remained were attacked by an Act of the Corporation 'to guard against fire and stagnant air.' In William Penn's time, they also talked of cutting off trees to purify the air.

"The tall sky-piercers, called Lombardy Poplars, were first introduced among us by William Hamilton, Esq., of the Woodlands, who brought them with him on his return from Europe in 1786–7. William Bingham, Esq., first planted them in long lines, and closely set, all round his premises in the city. As they were easily propagated and grew rapidly, they soon became numerous along all our streets. In time they were visited by a large worm, the bite of which was considered poisonous. It received the name of the 'Poplar Worm.'

"The 'Mansion House' [Fourth and Spruce], built and lived in by William Bingham, Esq., about the year 1790, was the admiration of that day for its ornaments and magnificence. The grounds, generally, he had laid out in beautiful style, and filled the whole with curious and rare clumps and shades of trees ; but in the usual selfish style of Philadelphia improved grounds, the whole was surrounded and hid from the public gaze by a high fence. An occasional peep through a knot-hole was all the pleasure the public could derive from such a woodland scene. After Mr. Bingham's death, the whole was sold off in lots, and is since filled up with houses."

LEWIS' LEAF-CHART, NO. 7.—The Leaf-chart, No. 7, prepared by Miss Graceanna Lewis, Media, Pa., which series she is publishing for use in schools, is devoted to the willows and poplars. As great care is used to have the species accurately determined, the charts are as useful to students in dendrology, as well as in schools.

LOGAN.—It will interest botanists everywhere to know that the dwelling and part of the grounds of James Logan, in whose honor *Logania* was named, and which stands as the type of the beautiful Natural Order of *Loganiaceæ*, has practically come into possession of the City of Philadelphia, and will be preserved for all time as a public park.

When Councilman Meehan began his successful movement for small parks in Philadelphia, in 1885, he selected, as far as practicable, famous gardens that the cold hands of brick and mortar had not already seized. In this way, Bartram's, MacMahon's, and Logan's grounds were among the first to be prepared for jury proceedings. The first two have been taken and paid for.

After Logan's had been placed on the plan, it was found that two ladies, descendants of Logan, owners of the grounds, anxious to preserve a small private grave-yard in which rested the bones of their ancestors, had prepared a deed of the house and eight acres of the plot now placed on the plan of the city as a park, conditional only that the graves should never be disturbed. These ladies are now deceased, and the trustee has turned over the deeds of this portion of the park to the city.

James Logan was Secretary of the Commonwealth to William Penn, and an admirable botanist. A paper on the sexes of flowers drew to him the especial regards of European botanists. He was as popular with the Indians as was William Penn. As the highest mark of respect an Indian could pay to a white man, Wingo, a chief, offered to change names. Logan explained that the white man's rules

required the perpetuation of the family name, but he might take his name, and the beautiful stream running through his grounds should bear the name of the Indian,—and thus we came by the famous Pennsylvanian Indian Chief Logan, and the (then) beautiful Wingohocking,—now wholly covered for public uses. The property will be known as Stenton Park, —this being the name of the estate,—there being already a Logan Square in the city.

F. W. LOUDON.—The originator of the Loudon Raspberry, Jessie Strawberry, and other fruits valuable but not largely known, Francis William Loudon, died at Janesville, Wis., on October 2nd, at the age of eighty. He was born at Troy, N. Y., living a rather retiring life, though one of hard service in his devotion to new fruit productions.

COMMERCIAL VIOLET CULTURE,—by B. T. Galloway. Published by the A. T. De La Mare Company. A beautifully illustrated and practically useful work, covering the whole subject of violet history and violet culture.

VERBESINA.—According to Robinson and Greenman, in new series No. XVI of "Contributions from the Gray Herbarium," *Verbesina*, a genus of which we have numerous representatives among our Southern wild flowers, has no less than 109 well-defined species.

GENERAL NOTES.

HORTICULTURAL EXHIBITION IN EGYPT.—Under the patronage of the Khedive of Egypt, who is a rare lover of gardening, an exhibition is to take place at Ghezireh, Cairo, on the 30th and 31st of March and April 1st, 1900, at which Americans are especially invited to be competitors. A program in very good English has been prepared, which may be had by addressing W. Wilfred Carey, Sec'y, Kasr-el-Doubara, Cairo, Egypt. Carnations, lilies, pansies, phlox, stocks, violets, roses, and "any good thing not specified," are among the special articles to be exhibited by florists, for which silver medals and sums of money are offered. Fruits named are bananas, and forms of citrus fruits,—and preserved fruits and vegetables are freely quoted. There is also a chrysanthemum show, at which other articles of a general character are also invited, on Nov. 3d, 4th and 5th, but the notice is too short for Americans to profit thereby.

FLOWER-POTS AND MATRIMONY IN JAPAN.—Strolling through the streets of Japan, Europeans wonder why empty flower-pots are suspended by three chains from the windows, and empty fancy vases are placed on the verandas. They are told that it is a way of signifying that there are marriageable young girls within.

In Japan, the flower-pot is an important symbol in matrimonial customs; epistolary declarations and nocturnal serenades are not the fashion. Etiquette demands that the suitor shall, under the window of the *mousmé*, or young girl, with whom he is enamored, fill the vase with earth and the plant of his choice.

Before proceeding in this little operation, Romeo assures himself that Juliet and her mother are at home; these ladies naturally affect not to see the young man adorning their pot with his flowers.

The young girl is free to act as it pleases her; if she takes care of the plant, watering it with her own hands, the young man may present himself without fear, being assured that his suit will not be rejected. On the other hand, if on the morrow he finds his plant, bruised and withered, at the feet of the passers-by, his course has been unfavorable.—*La Semaine Horticole. Translated by S. D. Lanning.*

ORTHOGRAPHY OF PLANT NAMES.—A correspondent inquires why the names of species are sometimes written commenced with a capital and sometimes not. Linnæus introduced it with his binomial system to indicate that the adjective or specific name had been once used as a proper or generic name. There is no other way to convey this information. For instance, in the pretty Western composite, *Bigelowia Bloomeri*, we write the adjective with a capital, to convey the information that it was named in honor of Mr. Bloomer, the botanist; but if written *Bigelowia bloomeri*—and a zoologist might so write it—it might indicate that the flower had some connection with a special article of ladies' dress. Botanists seem right in adhering to Linnæan rule in this respect.

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